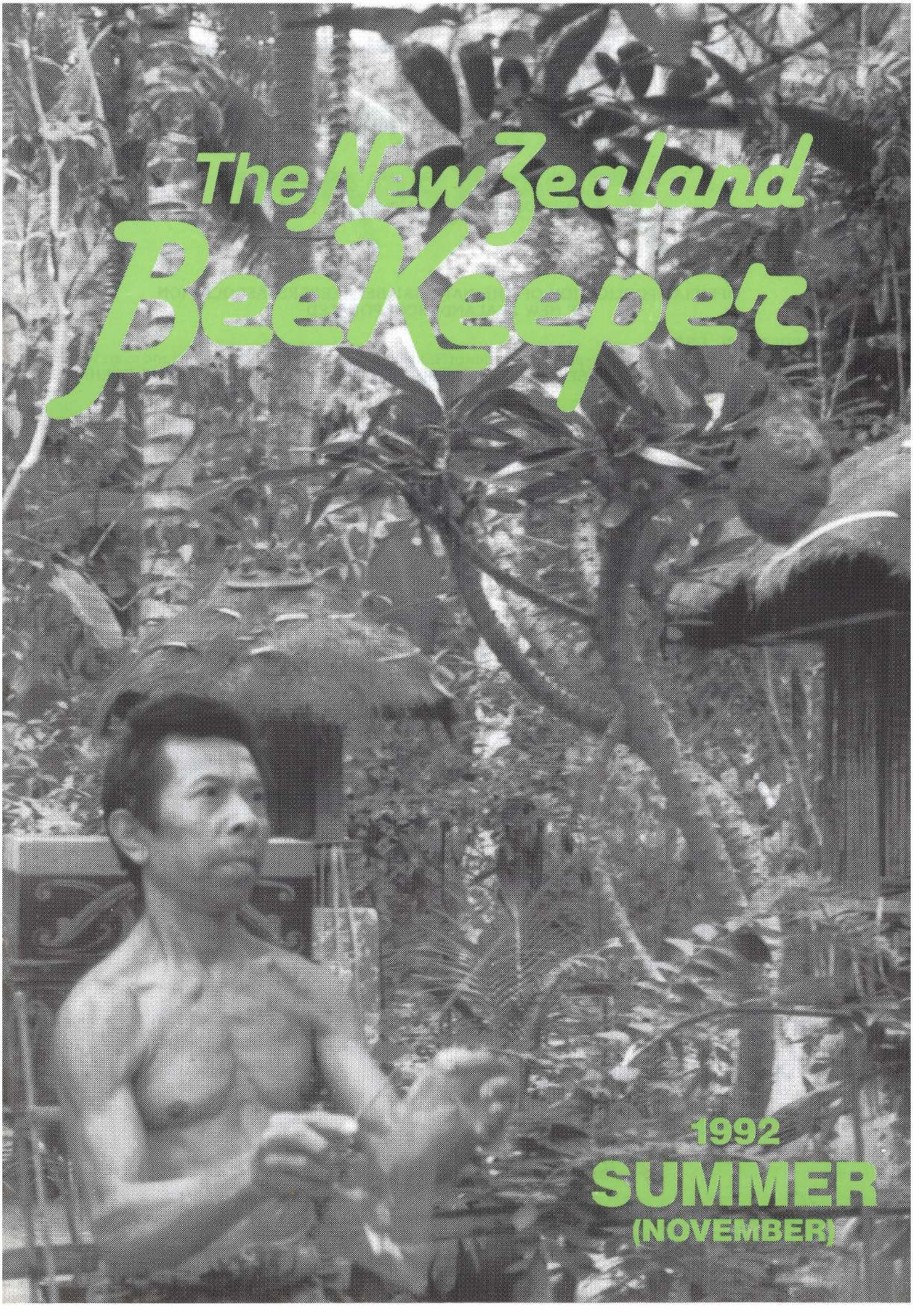

The New Zealand BeeKeeper

1992

SUMMER

(NOVEMBER)

The New Zealand BeeKeeper

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

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

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TIDYING UP THE ACT

From Ham Maxwell

Talk to a beekeeper, ask about any aspect of his or her calling and the response is usually sufficient to indicate a love of the subject. Then ask about the processing of honey from comb to pot. Again that same enthusiasm is evident. But ask about the disposal of the crop, and is the honey processed in a "registered food processing depot". Silence.

Nothing can silence some beekeepers more quickly than a reference to the licencing of their premises as required by Food Handling Regulations. Yet these same people would become most indignant if they suspected that their salami was packed and processed in unlicenced premises. Why then one law for them and one law for others? If the public at large is to have protection then **all** premises used for the preparation and handling of foodstuffs must meet a common legal requirement. Staff too need training in hygiene related to foodstuffs. Whether a one-man-band enterprise or a swept-up outfit employing a large staff, the public welfare must be placed first.

Endeavouring to side-step the legal requirements because honey is known to contain a high proportion of antibacterial properties is no argument. Using second-hand jars and pots is another. Honey for export must be certificated to the registered packing house, so why not honey intended for the local market? To be fair, the larger the scale of operation of the beekeeper, the more likely the chance that a registered packing house is used. A large financial outlay invariably means the operator's conformance is assured, for to be shut down in the middle of a season could prove to be financially disastrous. In today's market there are many easier ways of "going under."

What if the operation is only "tinpot"? A health licence is no longer cheap. To come up to the required standard is not a financially viable proposition for hundreds of beekeepers in this country. Yet by producing more honey than they can use, they are forced to shut a blind eye to legislation. Some do so blatently, some hesitantly, many chose not to know. Some larger commercial beekeepers will willingly extract honey for "amateurs", some will not, considering such activity an uneconomic use of their equipment. These latter therefore unwittingly force their potential customers to look elsewhere and adopt other methods. So the vicious cycle is repeated, season after season.

How can the honey industry push for promotion of its product on the basis of having a product ideal for the continuation of "Good Health", yet also turn away prospective clients and perpetuate the continuation of honey processing in "unhealthy" premises?

Like it or not, we are collectively responsible for the health of our nation. To wear blinkers and see only what we want to see in terms of health is not good enough. The record of the beekeeping industry in the field of public health is something this writer has yet to become aware of. Hiding our heads in the sand is, sadly, an all too common occurrence in the beekeeping industry. We should not be afraid of public awareness of our efforts to improve the standard of our processing, rather we should be trumpeting it.

Recently the meat industry has been doing just that, triggered no doubt by the locating and shutting down of illegal slaughter houses. The same thing on a smaller scale will happen to our industry eventually if we sit on our butts and ignore what goes on. The processing of honey in unlicenced premises is as big a crime as the slaughter of a cow in a backyard butchery. The basic principal is no different. Both operatives are ignoring a legal requirement to meet a common standard.

In Australia it is easy for the "amateur" to let the packing house have the surplus honey from the crop. In this country many small beekeepers simply have no idea of the names of the packers of honey, let alone know whether they would want to buy a few 20 litre pots of honey. Why the secrets? Now that MAF is a commercial entity, a campaign to let small beekeepers know about packers could be made together with the posting of the annual hive returns.

If as whispers suggest, the food hygiene regulations are to be tightened up, then for once let our industry be there taking the first steps in publicising improvements. Failure to get in first can only lose us a market share for our product.

A TASTE OF HONEY GISBORNE STYLE

Gisborne Honey Producers will be spearheading its diversification into Asia at the Taipei show, but it is no stranger to exporting to niche markets.

Marketing manager Barry Foster said GHP had exported to Saudi Arabia and lately to the UK. More recently representative, Brian Smith had joined a trade mission to Taiwan and had received a good response to GHP's products.

"We believe that there is an extremely good future in Asia for exports of New Zealand honey and particularly to such countries as Taiwan and we are targeting this area for our future exports," Barry Foster said.

The company produces three main types of honey, Manuka, Tawari, and Wildflower, as well as clover honey and wildflower cut comb honey.

Foster believes the medicinal properties of Manuka honey will be particularly attractive.

"Research into this honey at Waikato University has shown that tested active Manuka honey:

a) can prevent the growth of a wide range of bacteria and some fungi

b) can prevent the growth of the bacteria Helicobacter pylori that is considered to be a causative agent for stomach ulcers (and also recently linked to cancer)

c) has substances that are chemically similar to Sodium Benzoate that is a common food preservative

d) appears to be one of the most antibacterial honeys so far tested in the world."

The company's Manuka honey is being marketed under the Pharm-Qual trademark.

The company will also be showing its kiwifruit and honey spreads, lemon and honey beverage concentrate, and comb honey.

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JOHN HEINEMAN LIFE MEMBER

John Heineman and wife Celia, surrounded by the family. The knees second from the extreme right belong to an ex-President of the NBA.

John Heineman was born in a village near Arnhem in the Netherlands on Boxing Day 1921. After primary and secondary school he attended a horticultural college, where he gained a Diploma of Horticulture. Subsequently he worked at the Department of Agriculture (Entomology) and at a large private estate. He got his first taste of bees at 15: a dirty black swarm and a straw skep, which was falling to bits. Going to school with a closed eye, cauliflower ear, and a terrific nose caused plenty of teasing.

Living and keeping alive in an occupied country during 1940-45 was not without its problems. He joined a Red Cross unit in 1944 during the battle of Arnhem where the 1st British Airborne Division was wiped out. Later John served with an auxilary police unit.

John met his wife Celia, while hiding from the Germans who were rounding up people for forced labour. This was at a farm belonging to friends. A good interlude with fun and games. Later she went home to look after her mother in the province of Zealand, in the far south-west of the Netherlands, which was liberated in late 1944. John, however, stayed north of the big rivers. They did not see or hear from each other for eight months. They became engaged in late 1945, but it took till July 1949 before they found accomodation and got married.

They emigrated to New Zealand in April 1952 with their two boys, aged 2 years and 8 months respectively and £80 sterling.

John's first job was at an orchard in Central Otago. That was followed by work on a sheep farm at Waikaka. There he met the late Mr W. T. Herron (Keith's father). He worked about six years for old Bill. It was time well spent, he says, for the experience gained at Greenvale Apiaries saved him many dollars and headaches later. Bill was an excellent mentor and a good friend.

Daughter Maria (now Allan McCaw's wife) arrived while they were on the sheep farm at Waikaka. John, his wife, and the two boys became naturalized New Zealanders at that time. It was a low key ceremony, John recollects, in the lounge of a neighbour who was a J.P., Maria, of course was born a New Zealand citizen.

The family moved to Milburn in 1960, and bought 15 acres with an old house on it. It was just a shell without any conveniences, but is was their own. They kept 24 hives at Waikaka which was the start of Milburn Apiaries. They took over 80 colonies from the late Mr Jack McFadzien in the same year and were faced with a first and second mortgage plus a personal loan from Jack, as well as looking after his hives. John first worked at the woollen mill, then, after a year or so, as assistant county clerk in the Bruce County office at Milton. The wages allowed them to pay off the second mortgage and the personal loan. Meanwhile their hive numbers steadily increased. Then Jack offered them the rest of his hives on the Taieri and John had to make up his mind whether to become a full-time beekeeper or stick to local body administration. It was a difficult choice he says, but they took the plunge into full time beekeeping. It was a struggle for a number of years and without Celia's cooperation and many sacrifices they would not have made it. Some of the credit also must go to the children, John says, they too helped on many occasions.

Neither of the two boys elected to become beekeepers but became fishermen, both own their own boats and are doing well.

Maria also had seen enough of the ups and downs of beekeeping and always maintained that she would not marry a beekeeper. She did not but Allen later became one!

Allen McCaw and Neil Walker took over the business gradually during the 1980's. They now are the partners running Milburn Apiaries Ltd. John and Celia are still financially involved, John says they are tolerated round the place to do the odd jobs, hang up the washing, look after the kids etc.

John and Celia have had, and still have, plenty of outside interests and are running out of time to do all the things that have to be done or they would like to do.

John has been with scouting for many years. He held a leader's warrant for 35 years, and is now Patron of the Bruce District. He is a keen bowler both indoor and lawn and has a shack at the beach nearby (lovely spot), goes swimming, tramping, and of course there is the garden and the beekeepers' library Both John and Celia feel very fortunate indeed to be able to do all these things at this stage of life.

John has been involved with the Otago Branch of the NBA since he came to Milton. He took over the beekeepers' library when Chris Dawson retired. He has seen it grow substantially and it gives him lots of interest, lots of contacts, lots of friend. John became a Life Member in 1984.

John and Celia have no regrets about making the decision in 1952 to come to this country. New Zealand has been good to them in many ways John says, and the environment is, in their books, vastly superior to that they left behind. New Zealand is a much better place to live and grow up in.

POLLINATION OF KIWIFRUIT BY HONEY BEES

From B.J. Donovan and P.E.C. Read
Landcare Research NZ Ltd

ABSTRACT

Experimental results show that one honey bee visit in four to female flowers of kiwifruit results in sufficient pollination for fruits to grow to export weight of 72g. Modelling of the numbers of bees required per hectare, based on a number of facts and substantiated assumptions, shows that only 148 bees need to be visiting female flowers at any one time for six hours per day for five days for all flowers, on average, to be sufficiently pollinated for fruits to grow to export weight. If a hive has 4000 pollen foragers in the field at any one time, and as many bees need to be visiting male flowers as are visiting female flowers, and all the bees visited kiwifruit flowers, 13.5 hectares could be pollinated. However, bees do not systematically work all the flowers, so under this scenario many flowers may be visited a number of times, and others not at all.

Nevertheless, a re-examination of the data of Palmer-Jones and Clinch (1974), in the light of our model, shows that their recommendation of eight hives per hectare is excessive. In comparison to many other flowering crops, the flower resource of kiwifruit is very small. Under the best of flowering conditions, kiwifruit does not have the capacity to carry many more foragers per hectare than can be supplied by one and one-third hives.

Much more research is needed in mature orchards before changes to the present pollinating regime should be contemplated.

1. Pollinating efficacy of individual honey bees.

INTRODUCTION

The pollination of kiwifruit by honey bees has been the subject of much research since the first trial in New Zealand was reported by Palmer-Jones and Clinch (1974). Where hives were placed among four kiwifruit orchards at the rates of 2.5, 2.5, 5 and 7.8/ha, the number of bees per 1000 flowers and buds varied little between orchards, and nearly 100% of the flowers developed into fruits of good weight. However, it was concluded that adequate pollination was difficult to obtain for several reasons; nectar is not produced, the pollen is dry and unattractive, and citrus and white clover flowers which are more attractive draw off bees. It was therefore tentatively recommended that to ensure adequate pollination, orchards be stocked with eight hives/ha. This is still the standard stocking rate that is being used in New Zealand and many other countries.

There are at least two methods of studing the pollination requirements of a crop, which approach the problem from opposite directions. One method, followed by Palmer-Jones and Clinch (1974), is the stocking of a crop with

Fig 1: Female kiwifruit flower enclosed in a fibreglass netting bag.

different numbers of hives, followed by an examination of the effects of the different stocking rates on crop pollination and crop yield. A second approach is to examine the effects on crop yield of visits by individual bees to flowers, and from many observations, deduce the number of bees that need to be visiting the crop over a period to effect the required level of pollination. From this, the number of hives needed per area of crop can be calculated.

In 1983, we decided to follow the second approach. We set about the task knowing that individual bees would probably be carrying different quantities of male pollen grains, and so would have differing likelihoods of depositing sufficient pollen grains on female flowers for full pollination. Some bees may have come straight from hives, and so would be carrying few, if any male pollen grains. Others may have been visiting only or nearly only female flowers since leaving the hive, and others still may have picked up many pollen grains from male flowers, but may have already depleted their available male pollen by since visiting many female flowers.

The results of our study were presented at the Sixth International Symposium on Pollination which was held in Tilburg, The Netherlands, in August 1990, and were later published (Donovan and Read, 1991). However, as that report is not readily available to New Zealand beekeepers, a condensed version is presented here. Further, the original work is extended with calculations that indicate that far fewer bees are needed for adequate pollination of kiwifruit than has previously been considered to be the case, Also we reinterpret the work of Palmer-Jones and Clinch (1974), and compare the results with our calculations.

METHODS

We conducted our studies on a 0.5 ha orchard of four-year-old vines of the cultivar "Hayward", at the DSIR Riwaka Research Station, Motueka. The layout and management of the orchard was standard, with one male to eight female vines. Four hives of Italian honey bees were sited along one boundary.

On 22 November 1983, 13 bunches of from three to eight female flower buds which were about to open were enclosed in bags of 1.5mm mesh fibreglass netting. This size of netting was chosen so that honey bees and other similar sized insects would be excluded, but that movement of air and pollen and the penetration of sunlight to the flowers would be affected as little as possible. The bunches of buds were grouped around the middle of the orchard, and eight were each on separate vines, two were on one vine, and three were on another. At this time male vines were approaching full flower, and female vines were at about half flower.

From two to seven days later, when the bagged flowers had fully opened, the bags were removed when honey bees were visiting other kiwifruit flowers. We then constantly observed the unbagged flowers, and after one honey bee had visited a flower, the flower was enclosed in an individual fibreglass netting bag, so that further bee visits were not possible (Fig. 1). A 'visit' was considered to be physical contact, however brief, with stigmas and/or anthers. Wherever possible, the closest flower that had not been visited by a honey bee was similarly bagged as a control. Control flowers were never more than 100 mm from bee-visited flowers. Flowers were unbagged for no longer than one hour. Flowers, both bagged and unbagged, and elsewhere on vines, were observed for small insects such as thrips, that could have moved through the mesh of the bags.

Fruits were harvested when mature in June, and were weighed, and the seeds per fruit were counted. The effects of bee visits to flowers on fruit weight and seed number were examined mathematically and compared with fruits from flowers not visited by bees. Fruit weight was graphed against numbers of seeds to reveal relationships between the two.

RESULTS

Data were obtained from 43 flowers each visited once by a honey bee, and 24 control flowers (Table 1). Small insects were not seen on flowers.

One-fifth of bee-visited flowers and one-quarter of control flowers produced no fruits, and just over half of the bee-visited flowers and three quarters of the control flowers formed fruits that were below the export weight of 72 g. However, one quarter of the bee-visited flowers produced fruits of exportable weight, whereas no control flowers did so.

One bee visit to a flower increased the numbers of seeds per fruit by a mean 227, and fruit weight by a mean 21.4 g. The maximum and mean numbers of seeds in fruit from bee visited flowers were 12.4 and 7.4 times repectively greater than from control fruits, and for fruit weights, the corresponding values were 2.6 times and 1.9 times repectively. Statistically, one bee visit to flowers resulted in fruits that had more seeds and were heavier than fruits from control flowers.

The graph of fruit weight and seed number showed a curvilinear relationship — i.e. the more seeds, the heavier the fruit (fig. 2).

DISCUSSION

Viable pollen that reached the stigmas of control flowers must have been carried by wind. The degree to which the mesh bags would have reduced the movement of pollen to stigmas is unknown, but the numbers of seeds and weights of fruits were almost certainly less than what would have resulted from unimpeded pollination by wind. From Fig. 2 it can be determined that about 200 or more ovules need to be fertilized and to grow to seed to result in export-weight fruits, but the maximum seed count of 110 for control fruits was only about half the required level. The mean fruit weight, if repeated across the orchard, would have resulted in an unmarketable crop. Pollination by wind (if flowers were surrounded by mesh bags) would therefore not be commercially viable.

For flowers that received one bee visit, the mean increase of 227 in number of seeds in resultant fruits indicates that a mean of at least this number of viable pollen grains was deposited on stigmas, as at least one male pollen grain is needed for each seed that grows. The mean increase of 21.4 g in fruit weight, if added to the mean for controls of 24.8 g, would produce fruits of 46.2 g, still too light for export. However, two bee visits would result in fruits with a mean weight of 67.6 g, which is very close to export weight, and three bee visits would on average give rise to fruits weighing 89 g.

The lack of fruit from six control flowers and nine bee-visited flowers indicates that insufficient viable pollen was received by these flowers to fertilize enough ovules to stimulate fruit growth. Further, the formation of fruits below export weight by nearly 75% of bee-visited flowers indicates that three out of four bees deposited insufficient viable pollen, in addition to that carried by wind, to result in export-sized fruit. Some reasons for this may be that the bees carried no or too little pollen that was available for transfer (i.e. not packed into corbiculae), or that contact with a flower was too fleeting to transfer pollen, or contact was not with the stigmas. Conversely, the production of export-sized fruits by one in four flowers visited by one bee, indicates that sufficient viable pollen was deposited in addition to pollination by wind, to stimulate the growth of 200 or more seeds.

In this orchard then, in order to produce fruits of export size, on average each flower would need to be visited by about three honey bees. However, without presumed restrictions caused by the mesh bags to the movement of wind blown pollen, a higher level of wind pollination would mean that fewer than three bee visits would be necessary. To more accurately define the number of bee visits, the level of pollination by unrestricted wind in the completed absence of insect visits would need to be determined.

2. Model of the number of bees and hives needed per hectare

To develop a model, a number of assumptions must be integrated with facts. The following were used:

1. Number of female flowers per hectare:

Orchards nine years old produce 24 tonnes of export fruit/ha. (Chapman, Scott and Miller, 1982). If the mean weight of export fruit is 90 g, then there would be at least 266,666 female flowers/ha. To allow for flowers that produce fruits below export size, female flowers may total 300,000/ha. At peak flower-

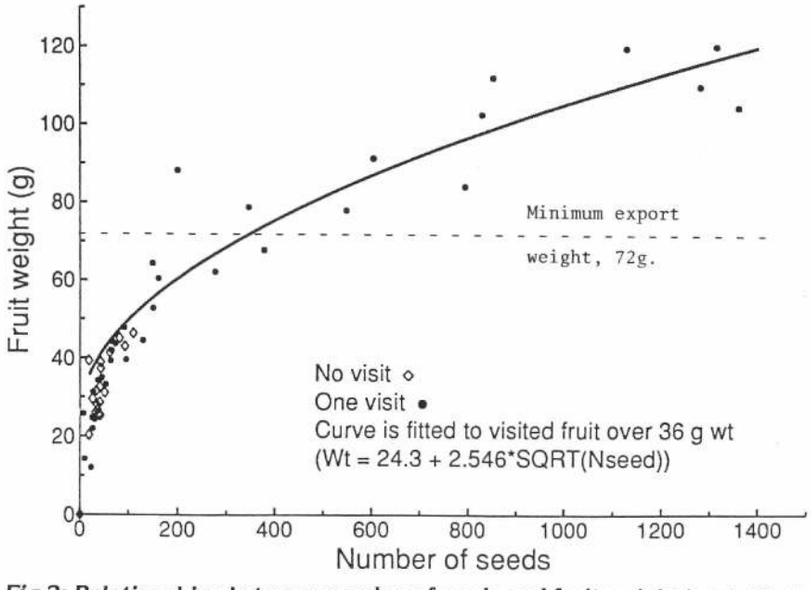


Fig 2: Relationships between number of seeds and fruit weight in kiwifruit.

ing, two-thirds of these flowers, or 200,000, may be open at once.

2. Female flowers can be fully pollinated for up to five days (Goodwin and Ten Houten, 1989).

3. There are 300 female vines/ha. (and 37 male vines).

4. Honey bees fly for six hours per day.

5. Honey bees will visit three female flowers per minute.

6. One beehive used for pollinating kiwifruit may have 4,000 pollen foragers in the field at any one time for six hours per day.

Calculations, using the above data.
(a) Number of bees needed per hectare.
In six hours, one honey bee working only female flowers will visit:
6 x 60 minutes x 3 = 1080 female flowers.

So in five days, one honey bee will visit:
1080 x 5 = 5,400 female flowers.

hours per day over five days of bloom then all flowers on average would be pollinated sufficiently well for fruits to grow to export size.

However, other honey bees — perhaps an equal number — would have to be visiting male flowers to pick up male pollen for transfer to female flowers, so the total number of pollen foragers needed per hectare at any one time would be:

148 x 2 = 296.

(b) Number of hectares that could be pollinated per hive.

If one beehive has 4000 pollen foragers in the field at any one time for six hours per day for five days, then the number of hectares that could be fully pollinated by the bees from the hive if all were to visit only kiwifruit, is:

4000 ÷ 296 = 13.5.

Flower Treatment	Number of Fruits			Maximum number of seeds/fruit	Maximum fruit weight (g)	Mean number of seeds/fruit	Mean fruit weight (g)
	0g	<72g	>72g				
No bee visit	6	18	0	110	46.4	35.3	24.8
24 flowers	25.0%	75.0%	0				
One bee visit	9	23	11	1359	119.8	262.3	46.2
43 flowers	20.9%	53.5%	25.6%				
Mean increases due to bee visit						227.0	21.4

Table 1 — Kiwifruit seed counts and fruit weights resulting from control flowers, and flowers receiving one visit from a honey bee.

If 200,000 female flowers are open at one time, the number of honey bees needed to be working female flowers for all to receive one bee visit on average, is:
200,000 ÷ 5,400 = 37.

But, with only one of every four bee visits resulting in a female flower being pollinated sufficiently for an export-weight fruit to grow, the number of bees needed per hectare for every flower to average four bee visits is:
37 x 4 = 148.

(The number of bees needed per hectare would be even lower if we used the **mean** number of bee visits needed for production of an export weight fruit, i.e. three).

So if there are 300 female vines per hectare, then at 148 bees on female vines, there would on average be only one bee per two female vines. In other words, if one could see an average of one bee per two female vines for six

DISCUSSION

Why eight hives per hectare?

Why then did Palmer-Jones and Clinch (1974) recommend that eight beehives be used per hectare? Their experiment used 2.5, 5 and 7.8 (reported as eight) hives per hectare on four orchards, (although the first and second orchards, and the third and fourth orchards adjoined, so the actual numbers of hives per hectare for the two areas were 2.5 and 6.4). They found that the number of bees per 1,000 flowers and buds varied little between orchards. They concluded that kiwifruit produces only a dry, rather unattractive pollen, and that the more attractive flowers of citrus and white clover draw off bees. However, they also found that in their four orchards nearly 100% of flowers developed into fruit of good weight. Nevertheless, they concluded that pollination is difficult to obtain because of various factors such as adverse weather, and injudicious spraying of citrus trees which may cause bee mortality.

Re-interpretation of data

The data of Palmer-Jones and Clinch (1974) can be reinterpreted, and when considered in the light of our model, quite different conclusions can be reached.

The finding that nearly 100% of flowers developed into fruits of good weight, means that there was nearly 100% pollination at all hive stocking rates, i.e. even the lowest stocking rate, in conjunction with an unknown degree of pollination by wind and other insects, provided abundant pollinating bees. Therefore, the higher stocking rates must have been providing far more bees than were necessary. Palmer-Jones and Clinch (1974) found that the total number of flowers and buds per female vine for the four orchards ranged from 4,800 to 7,300. If two-thirds were flowering at any one time, it can be calculated from the data of Palmer-Jones and Clinch (1974) that the number of bees per 1,000 flowers from 37 counts made morning and afternoon, ranged between 0.12 and 1.06 (mean 0.53). Neither the number of female vines per hectare, nor the total numbers or weight of fruits are given, but if it is assumed that there were 200,000 female flowers open at any one time at maximum bloom, then the total number of bees per hectare on female flowers would have ranged between 24 and 212 (mean 106). In comparison, the number calculated by the model was 148. This very close similarity between numbers of bees obtained from two different approaches, suggests that the small number of bees calculated as being required for pollination is indeed correct.

Another perspective is that if 4,000 pollen foragers per hive were in the field at any one time, and if about the same number of bees were visiting male flowers as were visiting female flowers, then at 2.5 hives per hectare, a mean 97.88% of the foragers did not visit kiwifruit flowers. For 7.8 hives per hectare, the corresponding value is 99.32%.

Palmer-Jones and Clinch (1974) did find that for all orchards the maximum number of bees per female vine in one minute morning counts per 1,000 flowers and buds, when bloom was maximum and when condition for bee activity were optimum, was much higher than their more extensive counts given above. For the four orchards, between 6.1 nd 9 bees were counted, If two-thirds of the 1,000 flowers and buds were open at one time, then it can be calculated that the maximum number of bees on female vines on one hectare during one

minute would have been 2,700. If male flowers were being visited by an equal number of bees, one hectare would have accommodated 5,400 bees, or all the pollen foragers from one and one-third beehives. At 7.8 hives per hectare, 82.7% of foragers were not visiting kiwifruit flowers.

Bee carrying capacity of crops

The interrelationship of bees and flowers can be looked at from the number of bees that the flowering crop has the ability to carry. Compared to almost any other crop, kiwifruit has an extraordinarily low number of flowers per hectare. For example, lucerne may have up to 2,000,000,000 flowers per hectare, (tysdal 1946) and white clover is conservatively estimated to have 35,000,000 flowers per hectare (P. Clifford pers. comm.). Apples in New Zealand have about 3.7 million (S. McArtney pers. comm.), or perhaps 2.5 million open at peak flowering, or about 12.5 times more flowers than kiwifruit at peak bloom. Although bees visit these flowers more quickly than they do the flowers of kiwifruit, the secretion of nectar as well as the production of pollen provides a much greater resource for bees than do the far fewer, although much larger, nectarless flowers of kiwifruit. In other words, a hectare of kiwifruit does not have the capacity to provide forage for at most more than a few thousand bees, and then only for a short while when fresh pollen is present. Thereafter, the flowers can support only a hundred or so bees for most of the time. The observation often made that most bees from eight hives per hectare fly away over the shelterbelts to forage, is simply because there is not sufficient unexploited forage resource in flowering kiwifruit to hold them on the crop.

That kiwifruit flowers are not inherently unattractive to bees is the frequent observation that where hives are not brought in to an orchard, some honey bees, bumble bees and in some areas native bees will usually appear and work the flowers.

CONCLUSIONS

Both the model and a re-interpretation of the data presented by Palmer-Jones and Clinch (1974) show that no more than a couple of hundred bees are needed at any one time over the blooming period for the bulk of flowers to be sufficiently well pollinated so that most fruits grow to export size. The recommendation of eight hives per hectare is therefore excessive.

However, what should a grower do in the light of this information? Palmer-Jones and Clinch (1974) made the point that adverse weather can severely limit bee activity. So, if bees have been unable to fly for a number of days, a little more than one hive per hectare should then provide sufficient bees for a reasonably high level of pollination within a few hours. Further, bees do not visit flowers in sequence, so that not all flowers will receive an equal number of visits. Thus, more bees will be needed than calculated to be sure that most flowers are visited by up to four times. Another point is that the research that determined that one bee visit in four pollinates to export weight or more, should be repeated in mature, commerical orchards. In our study in a four-year-old orchard, only 200 seeds were needed per fruit for fruits to grow to export size, but Hopping and Hacking (1983) found that 800 seeds were needed in a 16-year-old orchard for fruits to reach more than 70 g. On the other hand, Goodwin, Ten Houten and Perry (1991) warned that data on the flesh to seed ratio of kiwifruit suggest that much of the blame for small fruit may not be because of poor pollination.

RECOMMENDATIONS

In the light of all the above then, the safest approach for both beekeepers and kiwifruit growers is not to make drastic changes to current pollination management methods that are associated with the production of high percentages of flowers giving rise to export weight fruits.

Our research and modelling exercise plus a re-interpretation of earlier work, needs to be extended and evaluated in mature orchards before changes to accepted practices could be recommended with confidence.

References

Chapman, W. G., Scott, M. E. and Miller, D. G. 1982: An evaulation of the New Zealand kiwifruit industry. **Development Finance Corporation of New Zealand:** 1.55, plus 3 pages of appendices.

Donovan, B.J. and Read, P.E.C. 1991: Efficacy of honey bees as pollinators of kiwifruit. **Acta Horticulture 288:** 220-224.

Goodwin, M. and Ten Houten, A. 1989: Maximising pollination in poor weather. **New Zealand Kiwifruit, February:** 20 and 22

Goodwin, M., Ten Houten, A. and Perry, J. 1991: Have you a pollination problem? **New Zealand Kiwifruit, October:** 25-26.

Palmer-Jones, T. and Clinch, P. G. 1974: Observations on the pollination of Chinese gooseberries variety 'Hayward'. **New Zealand Journal of Experiemental Agriculture 2:** 445-458.

Tysdal, H. M. 1946: Influence of tripping, soil moisture, plant spacing and lodging on alfalfa seed production. **Journal of the America Society of Agromony 38:** 515-535.

On page 11 of the Spring Issue we ran a list of concerns which had contributed to the Marketing Fund. Marlborough Gold Honey should have been included. We regret this error.

GEORGE NICHOLS IN BALI

"Oh, you are going to Bali as well, George, how about looking for bees while you are there? We know something of the bees of many of the Indonesian islands but nothing definite about those in Bali. There may be two species of bees there which make very small combs. See if you can collect some and send them to me in this box." This from Dr. Gard. W. Otis in Guelph University, Canada.

Many years ago we had hosted Professor Townsend from Guelph when he was on sabbatical leave in New Zealand, so when Pam and I decided to go back to England for our fortieth wedding anniversary I wrote to Professor Townsend, to say we were on our way and could we come to Guelph to see something of the bee research. Gard inviting us.

Anyway, here we were in a most interesting laboratory, looking at tropical bees, hydraulic tail gates for trucks, discussing raising queens from eggs, raising queens in the Far North where there are no native drones so it is a case of bring your own (and I don't mean a dozen, you boozey lot of Kiwis). Most interesting was the large cellar for wintering bees: air blown in at ^{4} degrees C. at the top and the carbon dioxide removed at the bottom. The low temperatures also inhibit wax moths in equipment stored there in summer. We met Paul Kelly who had done a New Zealand tour which included a few days with David Yanke. Greetings David!

In Bali we got through customs and were met by Agung of Jan's Tours who took us to our hotel. On the way he asked if he could take us on any tours in Bali, so I suggested beekeeping which rather surprised him. Anyway we made a date for a tour and left him to organise it. A couple of days later he rang to confirm our tour for the following morning.

I thought the tropics would be a-buzz with a horrible excess of nasties but I was wrong. I could find no flies, a few mosquitos and butterflies, some ants, but no bees. However, on the morning

Note the log hive hanging high above the group. Pam Nichols is on the right.

Close-up of a log hive.

of our tour I found, in the garden, a little plant about 15 cm tall and covered in mauve bells. The mauve bells were being worked by two sets of insects. The more numerous were tiny bee-like creatures with black and yellow bands, very easy to capture and showing no evidence of owning stings or perhaps I was lucky. The other insects were jet black and about the size of house flies. They did all the correct bee things inside the flowers but refused to be captured. The slightest movemement from me and they were off. I finally got the idea, wait until a bee had worked her way right inside the narrow part of the bell, then close the door behind her. Even with this brilliant idea I only captured two. My morning's prisoners I placed inside a 35 mm film box.

Agung arrived some ten minutes early (he wasn't born in the Hokianga or he would have been two hours late!) and off we went. I asked him if he could buy me a bottle of petrol to kill any bees we might find. That did not take long and then we were off hunting bees. First stop was Denpasar market where one of the stalls had a heap of tiny combs with honey, brood, and about 20 of the yellow stripey bees busily taking honey home again. I spent some time capturing the twenty bees which I stored in my glasses' case. I took a photograph of the combs but when it was printed later the horrible automatic focus had fixed itself on a woman's legs. (No, I am not a leg man!). The store keeper was a bit upset at me pawing all over the combs so Pam bought the one with most finger marks.

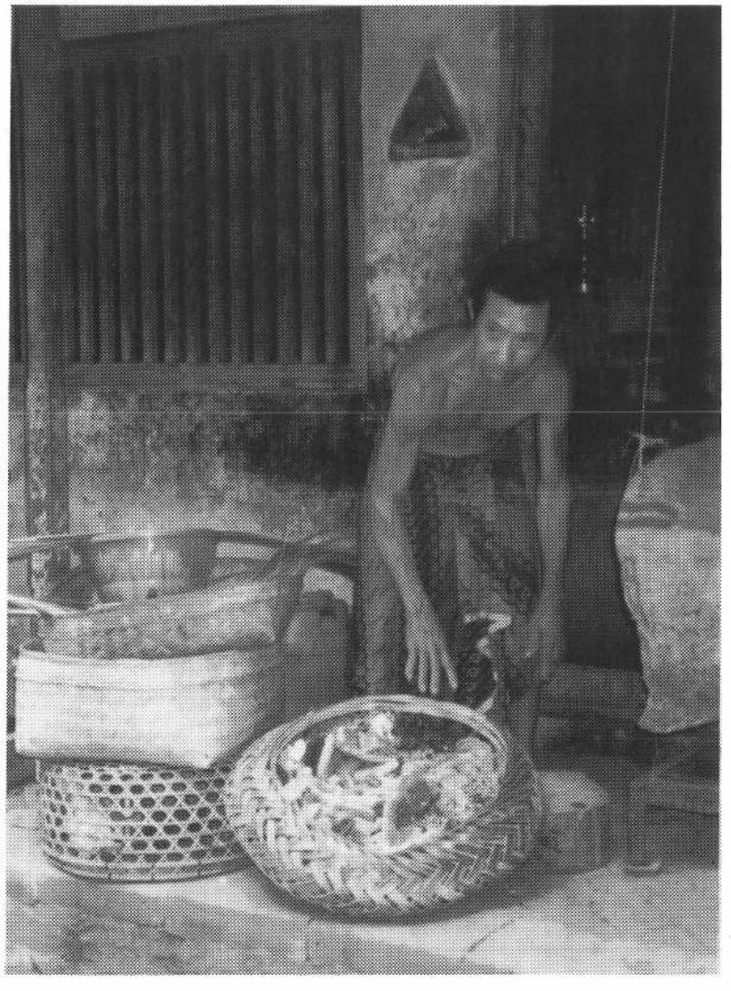
We went on our way through the bright green rice fields to Baliapa where we left the car and collected a young man to lead us through the jungle to the beekeeper's house. Hanging horizontally in the trees above our head we saw his hives. There must have been about sixty of them along the track to the house. Karmi the beekeeper met us outside, somewhat surprised to have unexpected visitors from far off New Zealand. I inspected the pile of empty hives, they were made from hollow coconut logs about 80cm long by 20 cm in diameter. I did not measure them since I had no ruler but each end was stopped up with a half coconut which gives a rough idea of the size. The half coconuts had small holes in their middles for the bees to go in and out. A piece of string attached each to its log in case it fell out, and each was jammed in place with coconut fibre. Some of the logs were lined with long wooden slats held in place by three wooden bands while others were left plain. I had a lot of unanswered questions, Agung's English was excellent but he was not a beekeeper and Karmi spoke no English which made communication difficult. Never mind! Karmi and I needed no words as he showed me round. He collected a long bamboo pole with a hook at one end and used this to lift a hive down from one of the trees. Inside, the yellow banded bees were clustered round four little combs, Karmi blew gently on them and they retreated to the far end of the log while he removed a comb of honey and brood for me to eat.

It was pleasantly aromatic in flavour, nothing like anything I had ever eaten before. Nobody was stung so they must be stingless bees, completely unagressive. I wonder how they survive?

Next Karmi showed me a wooden box hive with six removable wooden frames. The frames had no foundation and the bees had built four combs at about 30 degrees to the frames so Karmi was unable to remove them. I drew a Langstroth hive with supers in the dust at our feet and Karmi then produced a gauze rectangle with a slot at each end, put it on top of the hive,

Balinese beekeeper, Karmi, with a six-frame hive.

Spare coconut-log hives with half-coconut ends.



Karmi with a basket of honeycombs.

A Taste Of Honey Gisborne Style (cont)

"All of these products have favourable responses to samples from Taiwan as have samples of our honey mead made from Manuka honey. The mead won a silver medal at the 1990 NZ Fruit Wine competition," Foster said.

The mead is made in conjunction with the local cider winery Harvest Wine Co Ltd. Sample bottles of cider wine from Harvest will also be on display at the show.

GHP was formed in 1982 and set up a separate marketing arm in 1987. Among the more colourful of its export exploits was the niche market it developed selling honey to Yemenis living in Saudi Arabia. The Yemenis believed that eating honey in the 45 days after a woman has had a baby was beneficial. Foster explained. Yemeni men were also significant consumers. However many Yemeni left Saudi at the time of the Gulf War and direct sales to Yemen are more difficult because Yemen is a much poorer country.

and placed a super on it with another six frames.

Agung bought a bottle of honey and let us all have a taste. It had a pleasant aromatic smell almost like sandal wood. To check for water content, Karmi dipped a match into the honey, waited a few moments and then lit it. The match burned well. Apparently if the honey has too much water the match goes out. (I could not discover how the honey was extracted from the combs). He then showed me a flat basket filled with the little honey combs such as I had seen in Denpasar market.

Something I had never seen before, hanging by long strings from the branches of a tree outside his house, were two spheres the size of large coconuts. The spheres appeared to be made of brown paper and had holes the diameter of my thumb. I prodded one of the spheres with my finger and out poured a multitude of large black insects with orange wings and orange bums (not a good scientific description, but I'm and engineer, not a biologist).

I made a 'strategic withdrawal' and fetched my camera before they had all gone back home. "Please may I have one?" I asked Karmi. He went into the jungle and returned carrying a cane about a metre long in one hand and a green fruit oozing latex from its broken stem in the other. He applied the latex to one end of the cane which he then stood in a tin. While we waited for the latex to become tacky he handed round palm wine. With the latex at the right degree of tackiness, Karmi slowly approached one of the brown paper spheres. Gently he tapped the trunk of the tree with his hand and out came one of the black insects. Slowly he lowered the latex-coated end of the cane on to the insect. With a ripping sound from its wings the insect tore itself loose and hurtled off into the jungle. Karmi tapped the trunk of the tree again, ever so gently, and another insect appeared. This time he captured it and put it in a bag for me. I am not sure what these large insects are used for. Pam says they make soup from the larvae. Gard Otis told me later that these are wasps.

We thanked Karmi for his hospitality and returned to the minibus where I shut the windows, dampened a piece of toilet paper with petrol, and put it in the bag with the black insect. Back at the hotel I put the bees and my black treasure out in the sun to dry before we went for dinner. On our return we found that big black ants had also had their dinners and only the big black insect remained. Fortunately the morning's crop of little yellow and black bees and the even smaller pair of black ones remained intact in the film box so I packed them all in the absorbent papers in Gard's collecting box and posted them to him in Guelph. I wrote 'dead bees' on the customs' form much to the surprise of the clerk in the post office.

A Balinese wasps' nest

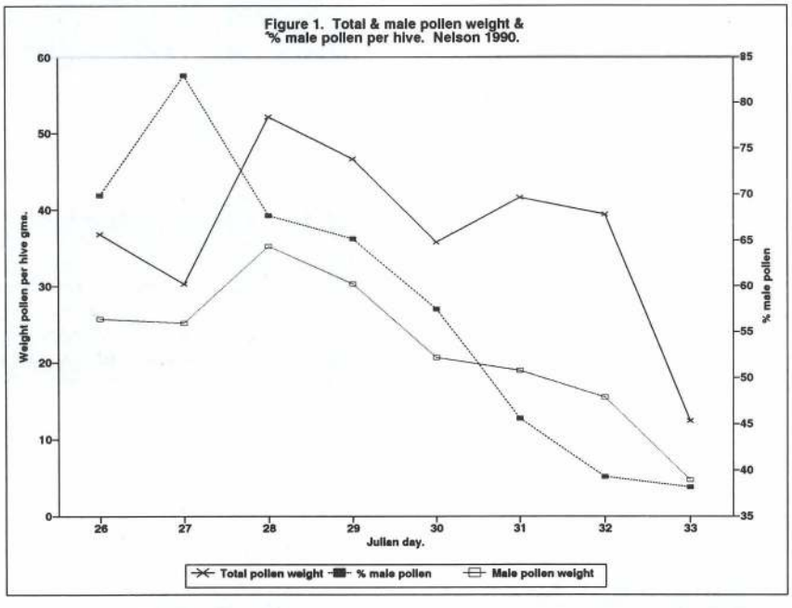
The Collection and Quality of Bee-Collecting Pollen for suplimental pollination in Kiwifruit.

From N.B. Pyke and P.A. Alspach, Hort Research, Riwaka Research Station

Pollination is important in most fruit crops, but in kiwifruit there is a need to transfer more viable pollen from the male to the female flower because of the requirement for somewhere in the order of 700 seeds to set a fruit with potential to be export size. Thus the need to get at least 700 viable pollen grains to germinate and fertilise the ovaries. Bee-collected pollen pellets (BCP) offer a potential source of relatively cheap pollen for enhanced pollination of kiwifruit. However considerable variation has been detected in the collection, quality and field performance of BCP.

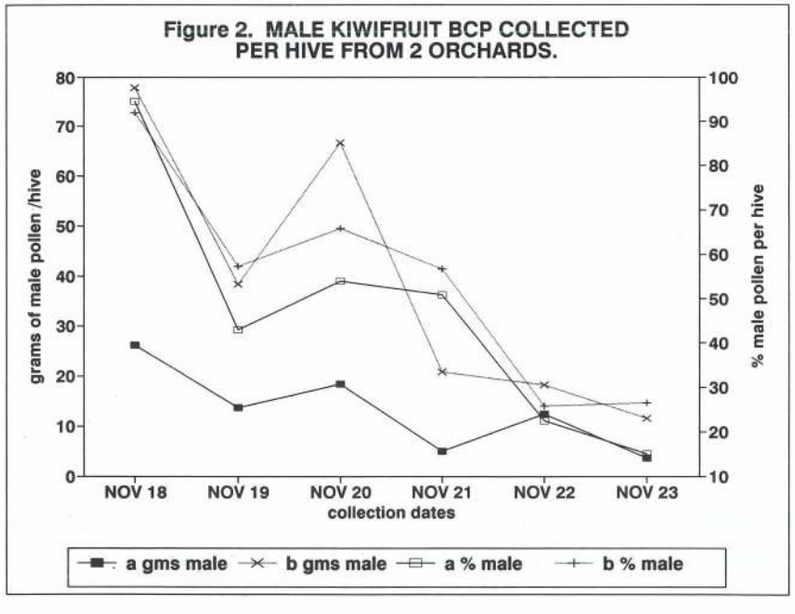
Some of the factors that can influence the pollen collection are related to the supply of pollen in the area and the environmental conditions on the day of collection. The percentage of male pollen, the total pollen, and the weight of male pollen collected per hive varied over the 1990 kiwifruit flowering season in Nelson (Figure 1). The percentage of, and total male pollen collected, declined throughout the flowering season. This trend has also occurred in the 1989 and 1991 seasons with some seasonal variation in the total and percentage of male pollen collected, although there was generally a decrease in the percentage of, and total, male pollen collected throughout the season, obviously daily fluctuations occur related to the local environmental conditions. Similarily considerable variation in the percentage of, and total male, pollen collected occurred between hives in an orchard and between orchards. There were also differences in the total male pollen collected on two orchards in the same season (Figure 2). Hives at orchard A consistently collected a lower proportion of male pollen than those at orchard B, although the seasonal pattern was similar at both orchards. Orchard B hives collected much greater quantities of male pollen than their counterparts on orchard A. Interestingly the daily fluctuations, probably related to the environmental conditions on the day, are similar at both orchards, but more dramatic at orchard B.

Figure 1. Total & male pollen weight & % male pollen per hive. Nelson 1990.



Although the quantity of pollen collected is important with regard to the economic viability of BCP, the quality of the pollen is likely to have a larger impact on the value of pollen collected. Quality of pollen relates to its ability to germinate on the flower and hence to fertilise an ovule. Thus it is important to understand the factors occurring prior to, during, or after the collection of pollen which impact on its performance on the flower. To do this, it is necessary to have a laboratory test which relates well to the performance of pollen on the flower. This is particularly difficult for bee-collected pollen as the bees add substances to the pollen pellets to prevent them germinating in the hive. Thus we have had to develop a germination test, which differs from the laboratory viability test, for hand

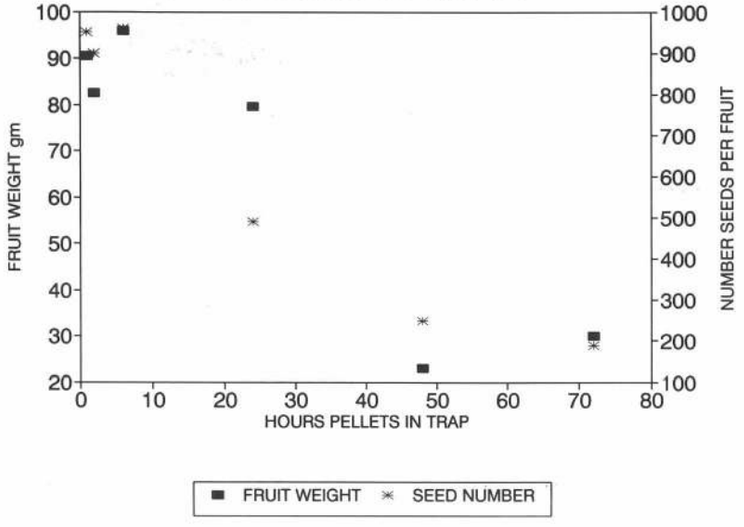
Figure 2. MALE KIWIFRUIT BCP COLLECTED PER HIVE FROM 2 ORCHARDS.



collected pollen, which accurately reflects the potential field performance of the pollen. Using this viability test it has been possible to examine the influence of a numberr of different factors on the quality of bee-collected pollen. The laboratory response can then be confirmed with a few field tests.

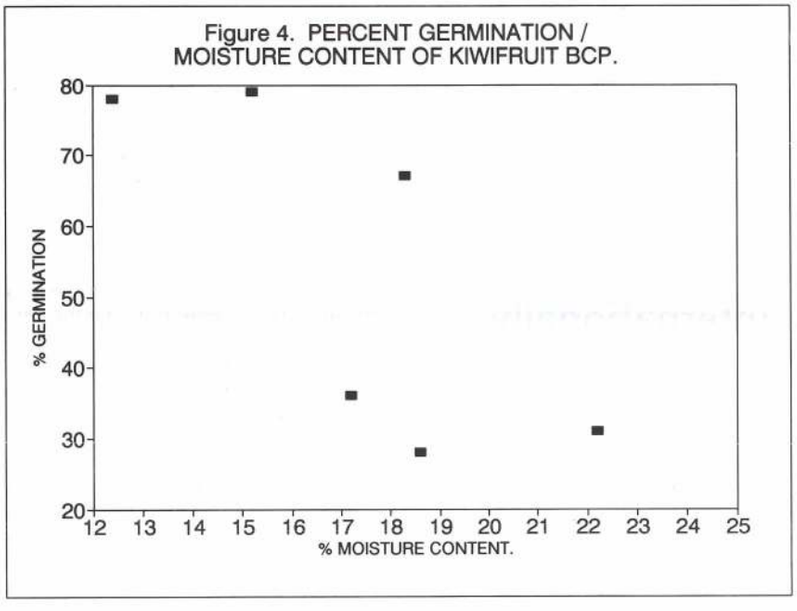
The time the pollen is in the pollen trap has a marked effect on the viability and field performance of BCP. The fruit size and seed number of fruit was not influenced when pollen was in the pollen trap for periods between one and eight hours but a significant change is seed number occurred after 24 hours and further reductions in both seed number and fruit weight resulted after pollen had been in the trap for 48 to 72 hours (Figure 3). Variations in the influence of the time is in the trap on the viability would be expected in relation to site, trap type, seasonal, and daily conditions. Thus to maximise the quality of pollen collected, the time pollen is in the pollen trap should be minimised.

Figure 3. EFFECT OF COLLECTION INTERVAL ON KIWIFRUIT BCP QUALITY.



Possibly the major factor which impacts on the viability of BCP is the moisture content of the pollen. High moisture-content pollen often has a lower viability than pollen with lower moisture content at the time of collection. This can be seen to be inversely related for the pollen collected in some seasons (Figure 4), However, the moisture content of the pollen has an even more marked influence on the viability of pollen if the pollen is stored at -18°c. In 1990/91 very little decline in viability occurred in pollen lines with moisture contents of 15% over a nine month storage period while pollen with a high moisture content, 20% or greater, declined to very low levels within the first three months. Some recent research has indicated that the pollen viability could be influenced by modifying the moisture content after collection. However attempts to modify the micro-environment in the pollen trap have proved to be unsuccessful.

Figure 4. PERCENT GERMINATION / MOISTURE CONTENT OF KIWIFRUIT BCP.



Bee-collected pollen has the potential to provide a source of pollen to artificially supplement pollination kiwifruit and other fruit crops. However, the quantity and the quality of the pollen collected will vary markedly by hive, by site, by season , and by day. Laboratory test have been developed for bee collected kiwifruit pollen which indicate the quality of pollen for immediate use and after long term storage. Such test should be used prior to application of pollen to kiwifruit.

DEBUT TIME FOR THE 'CLEAN AIR' CAR

An electric car designed and built in Britain for the first real attempt to pioneer general use of such vehicles made its public debut at the Frankfurt motor show recently.

The car, code-name the LA301, is the first to be built under a plan to put 10,000 electric vehicles on the roads of southern California by 1995. It has been produced by International Automotive Design (IAD) from Worthing in southern England for Sweden's Clean Air Transport (CAT), which has been contracted to mass produce silent, battery-driven cars by the Los Angeles department of Water and Power.

The LA301 is said by CAT to represent a major step towards improving air quality in the Los Angeles basin and other polluted areas throughout the world. It is expected to be the first electric car to take to the roads of Los Angeles by early 1993.

BIOLOGICAL CONTROL OF WEEDS

From Pauline Syrett, Richard Hill, and Tom Jessep, Landcare Research New Zealand Limited

Our team, working on biological control of weeds was formerly part of DSIR Plant Protection, but was transferred to Landcare Research New Zealand Ltd on 1 July 1992. Both the research and extension programmes will continue under the new organisation. Biological control of weeds projects are at various stages of development. In some cases, insect control agents have been established for a number of years and research is directed towards measureing the impact of control agents on weed populations. For other weeds, no releases have been made yet, and tests are being undertaken to determine the safety of potential control agents. This involves determining the host-range of an insect by screening it against a wide range of potential food plants. A brief description of the status of those projects of probable interest to beekeepers is given here.

Heather

Host screening tests with heather beetle, *Lochmaea suturalis,* have been carried out in the UK. Although some native New Zealand plants unavailable overseas have yet to be tested, results so far indicate that this leaf feeding beetle is highly host specific to *Calluna vulgaris.* It is likely that some beetles will be introduced into quarantine at Lincoln later this year for final testing. Before beetles can be released in the field, an Importation Impact assessment will be prepared, and an opportunity given for comment on its content.

Gorse

Farmers and noxious plants officers continue to manage and spread populations of gorse spider mites. They now have been released at well over 300 places nationwide and are beginning to spread. We have been monitoring the spread of the mites and their impact on gorse at Feredays Island, in the Rakaia riverbed. Mites were first released in 1990 but have since been found six kilometres east and five kilometres south of the release site. Populations at release sites reached high levels after the mites were first released. The impact of mites was patchy with up to 20% of bushes attached. On the heavily infested bushes some foliage died and the rest was turned yellow by mite attack. Regrowth in the following year was cut in half, while unattacked bushes grew normally. Mite outbreaks occur erratically and only a proportion of plants are affected. This is not unexpected and similar pattens occur in Europe. As we predicted some years ago, any reduction in gorse vigour and abundance will develop gradually and will require the full complement of agents which can be introduced.

Mites have established only poorly in the north of the North Island and the West Coast of the South Island where the climate is warm and wet. New strains of mites have been imported from coastal Portugal and Spain which may be better adapted to such conditions. These are being evaluated in the field and may be distributed soon. New insects have been released including *Agonopterix ulicetella,* a caterpillar which feeds on new growth in the late spring. It has been released at six sites. *Seriocothrips staphylinus,* a thrip which feeds all year round causing stippling of the foliage, has been released at 105 sites. The latest species is *Cydia succedana,* a caterpillar which destroys gorse pods in spring and autumn. Releases are planned in 1992.

New Zealand Bio-control Research is highly regarded Internationally

Permission has been sought to release *Scythris grandipennis.* This is a caterpillar which chews hard gorse foliage in winter and early spring. First releases could be made in 1992. Two further foliage-feeding caterpillars are being evaluated. Other species which may be examined are a root-feeding weevil and a disease.

Research is now underway to evaluate the impact on gorse infestations of each of the control agents as it establishes in New Zealand. There is no reason why successful control cannot eventually yield a stable gorse population which we can all live with.

Nodding Thistle

The biological control of nodding thistle project has progressed to the stage where three agents have been imported and released. The receptacle weevil, now established throughout New Zealand destroys a proportion of seed. A crown-feeding weevil damages developing rosette plants and has been established at many sites. First releases have been made of a European seed-feeding gall-fly. The intention of this project is that the combined effects of the three agents will reduce the necessity for costly and potentially damaging herbicides.

Broom

Work is progressing with testing in Europe of several insects which may be useful for biological control of broom *(Cytisus scoparius).* The broom psyllid (a sap-sucking bug) has been cleared for release, and first field releases are planned for summer 1992-3. Broom seed beetles were released at three sites last summer: in the central North Island (Lake Rotoaira), Otago (Gabriel's Gully) and at Lincoln, Canterbury. It is too early to tell whether they have established — sites will be checked in late spring to look for adult beetles and eggs laid on green pods.

Old Man's Beard

The International Institute of Biological Control is presently testing the suitability of four insects as biological control agents for old man's beard. New Zealand native *Clematis* specimens have been sent to Switzerland to provide experimental material and the susceptibility or ornamental *Clematis* species will also be measured.

International Symposium on Biological Control of Weeds

Last February the VIII International Symposium on Biological Control of Weeds was held at Lincoln University. This is the most important world conference in the field and is held every four years. It brought together research workers from over 30 countries. The conference was highly successful and showed that New Zealand bio-control research is highly regarded, internationally.

HONEY FOR THE TREATMENT OF INFECTIONS

By Dr Peter Molan
Dept of Biological Sciences, Waikato University

AN ANCIENT MEDICINE REDISCOVERED

Honey is one of the oldest medicines. Its use is recorded in Sumerian clay tablets estimated to be 4,000 years old, and in Egyptian papyri dated from 1900 to 1250 B.C. it is also mentioned in the *Veda*, the sacred scriptures of Hinduism, thought to be about 5,000 years old, and in the Holy Qu'ran and the Talmud. Hoppocrates (460-357 B.C.) used many of the Egyptian prescriptions. He found that honey "cleans sores and ulcers of the lips, heals carbuncles and running sores". Celsus *circa* (25 A.D.) used honey for many different purposes: as a laxative, as a cure for diarrhoea and upset stomach, for coughs and throat maladies, to agglutinate wounds and for eye diseases.

Honey has continued to be used in medicine ever since, but little was known about how it worked — it was not until just before the beginning of this century that bacteria were found to be the cause of infections. Although there are several reports in medical journals in the 1930's of honey being effective in clearing wounds of bacterial infection, it was not recognised in these reports that it had been established in laboratory work in 1919 that honey has antibacterial activity. It was not until the mid-1940's that more intensive laboratory studies were carried out, but by this time antibiotics were becoming available for the treatment of infections, and honey was displaced from use in medicine.

Despite the advent of antibiotics, honey has continued to be used in folk medicine, and it is from this pool of knowledge that the re-introduction of honey into modern medicine has come. There have been numerous reports in medical journals of this folk remedy being used as a last resort on infested wounds, burns and ulcers that were not responding to antibiotic treatment. The remedy was in all cases found to be remarkably effectivene. This effectiveness is being recognised in an increasing number of report. An editorial in the *Journal of the Royal Society of Medicine* in 1989 expressed the opinion that "the time has now come for conventional medicine to lift the blinds off this 'traditional remedy' and to give it its due recognition".

Recent research

Many researchers have reported that honey varies in the potency of its ac-

tivity. Despite this, none of the reports in the medical journals mentions any selection of the honey used. At the University of Waikato we have investigated how much variation there is in the antibacterial activity of honey likely to be used medically. Commerical apiarists supplies 345 samples of honey from 26 different floral sources for the study. The samples of honey were tested against *Staphylococcus aureus*, the most common wound-infecting species of bacteria. The activity of each sample was compared with that of a reference antiseptic, phenol (carbolic). It was found that the activity varied from a level that was the equivalent of 58% phenol to a level that was below the limit of detection (2% phenol). One third of the samples tested were of this low level of activity.

The results of this research (recently published internationally in the *Journal of Pharmacy and Pharmacology)* show the importance of selecting the honey used for medical purposes. Although all honey will stop the growth of bacteria because of its high sugar content, when the sugars are diluted by body fluids this antibacterial action is lost. The additional antibacterial components (primarily hydrogen peroxide generated by the glucose oxidase enzyme in the honey) then become important. Considering that carbolic disinfectant is usually used with a phenol concentration of 4-5%, it is evident that selected honeys can remain antibacterial when extensively diluted by body fluids.

Another finding in this research was that the hydrogen peroxide was not the only antibacterial substance involved in some types of honey. When testing samples of the honeys with the enzyme catalase added to remove the hydrogen peroxide, it was found that only two of the 26 floral types of honey contained significant levels of this additional antibacterial activity. In one of these, vipers bugloss honey, the level of activity was quite low. In the other, manuka honey, the additional antibacterial activity was in some samples quite high, although it is important to note that half of the 60 samples tested had very low levels or none of this additional antibacterial activity.

This additional antibacterial activity was considered to be important enough to warrant further investigation. As a project for her recently completed M.Sc. thesis, Dawn Willix compared the antibacterial activity of an average-level manuka honey with that of an average-level honey with activity due to hydrogen peroxide, testing them on seven different species of bacteria chosen as the ones most commonly involved in wound infection. The percentage (by volume) of each type of honey needed to completely prevent the growth of each species of bacteria was found to be:

Although some species are more sensitive to the action of one type of honey than they are to the other, on average there is little difference. The most notable point is that these "average" honeys can be diluted nearly tenfold yet still completely halt the growth of all the major wound-infecting species of bacteria. Also notable is the finding that an "average" manuka honey will still halt *Staphylococcus aureus* when diluted with 54 times its volume of fluid: this is not only the most common wound-infecting species, but is notorious for developing resistance to antibiotics.

The work has recently been carried further by microbiologists at Waikato Hospital looking at the effect of these two honeys on their collection of strains of MRSA, strains of *Staphylococcus aureus* that cause ward closures in hospitals because they are resistant to most or all of the commonly used antibiotics. All of the strains have been found to have their growth halted completely by the honeys diluted to 5-10%.

Similar sensitivity has been found in some other recent work, carried out at the University of Waikato, in which we tested the bacterial species that cause mastitis in dairy cattle. If honey is as effective in the udder as it is in the laboratory in stopping the growth of these bacteria, then it would be a very useful alternative to antibiotics as it would not need the milk to be held back because of unacceptable residues from the treatment. Injection of honey up the teat of a cow would cause no problems when it is considered that it can safely be put in the eye for the treatment of eye infections.

Stomach ulcers

In the traditional medicine of some parts of the world honey has also been used to treat dyspepsia and stomach ulcers. There are numerous reports of this treatment being used successfully in clinics in Russia in modern times, and a recent report of a clinical trial in Egypt which established that this traditional remedy is in fact effective. However, there has been no explanation of how honey works in this treatment, which has prevented the treatment from being considered seriously by many in the medical profession.

In the last few years it has been recognised that dyspepsia and stomach ulcers are frequently caused by infection of the stomach by a species of bacteria, *Helicobacter pylori*. The possiblity that the healing effect of honey on the stomach may be through its acting on this bacterium was suggested by Niaz Al Somai at the University of Waikato. In collaboration with microbiologists at the Waikato Hospital he tested strains of *Helicobacter pylori* isolated from biopsy samples of stomach ulcers, using the same two honeys that had been tested on the wound-infecting species of bacteria. It was found that the honey with hydrogen peroxide activity did not prevent the growth of cultures of *Helicobacter pylori* when added at concentrations up to 50%, but the manuka honey completely halted growth of the bacterium at a concentration of 5%.

A clinical trial is now being organised to find out if manuka honey has the same effect on the bacterium in the stomach as it does when they are on agar plates. There is much interest in this possibility because conventional therapy for stomach ulcers is far from satisfactory. Drugs which prevent secretion of acid in the stomach may allow an ulcer to heal but it frequently reappears. Only if *Helicobacter pylori* is eliminated is a lasting cure achieved, but it is a very difficult infection to clear. A combination of antibiotics and bismuth is required and unpleasant side effects often result. There is also the consideration that a very large amount of money is spent on the pharmaceuticals currently used to treat stomach ulcers. If honey is shown by clinical trial to be a reasonable alternative it would be a much cheaper option, although manuka honey is likely to become a lot more expensive if effective honeys from other floral sources are not found!

	Manuka honey	Other honey
Escherichia coli	3.7	7.1
Proteus mirabilis	7.3	3.3
Pseudomonas aeruginosa	10.8	6.8
Salmonella typhimurium	6.0	4.1
Serratia marcescens	6.3	4.7
Staphylococcus aureus	1.8	4.9
Streptococcus pyogenes	3.6	2.6

NEGLIGENCE

By John Heineman

It was well into November when a lengthy list of apiaries in our part of South Otago was earmarked for BL inspection and assigned to me. As it was already so close to Christmas, with all the extras that season demands and the fact that most hives were already supered for the hoped-for honey flow, I left the job till after summer, expecting to be able to go a bit faster and also to spare the old back somewhat when honey supers had been removed. It was April when I tackled the task, picking the good days.

First day went marvelously. The biggest client on my list was a farmer and part-time beekeeper. We went together in his four wheel drive. No searching for the sites, apiaries and hives all neat and tidy. All done and over in good time and on the way home we still had enough day light left to have a look at a couple of other apiaries also on my list. Very satisfactory indeed.

Other days followed, not all as good. A number of small apiaries with from two to six hives had to be visited, which ran away with many kilometres and too much time. The time loss was mainly caused because the apiary sites were poorly described. For example: Hive owner...address somewhere in Christchurch. Apriary site at Old Henly Road through red gate. Old H. road is about 10 km. long. Drove along it from start to finish but no red gate in sight. Just about ready to chuck in the sponge, I decided to turn up a dead end side track and there it was at the far end, the gate that once must have been red as traces of the paint still showed. Some distance further on past an old cottage, apparently used as a holiday home, I found the hives, two of them. What should have taken, say, a quarter of hour took more than one hour and 20 wasted km.

This inspection for disease is a costly affair but no doubt necessary. Some of it is done by way of diseasethons, some by voluntary part-time inspectors. Lots of it is currently done for little or no renumeration because of funding problems.

That will improve when the funding scheme, where all beekeepers with over 50 hives have to pay a special levy for this purpose, is established. This is not the place or time to argue the rights or wrongs of our system where the commercial beekeeper will carry the financial burden of hive inspection and where those owning less than 50 colonies get a free ride. That as it may be. But we should be able to expect every hive owner to supply a clear and precise description of apiary locations. It will save time, money, and avoid frustration. Please give this your attention when filling out your next hive return or when you register a site for the first

Taken after the growth had already been trampled.

time. Also see NZ Beekeeper no. 213: 18-19.

NEGLIGENCE

A very nasty word! Another apiary was difficult to locate but for a very different reason. It was easy to get to the farm where the site was located and the cocky happened to be in the sheep yards. So I stated my business, received his blessings and the message that the beehives would be hard to find as the site was badly overgrown. The owner of the bees (we shall not call him a beekeeper) had not been near his hives for the last two years. He, the farmer was heartly sick of the situation and sorry to have given the beekeeper the site etc, etc.

Down the track I went and sure enough no hives came into view. At last I glimpsed a corner of a hive roof peeping through blackberry. It was the most overgrown hive I have ever seen apart from some in the bush of a tropical country. Absolutely covered by blackberry, gorse, grass, rushes, and other growth. It was not easy to reach it. I had to beat a path through a veritable jungle.

There were 15 hives. Six had died. Cause of death, believe it or not, was without a doubt suffocation. The entrances had become so clogged that the bees could not get in or out. Dead bees, rotten brood and stinking fermented honey in the mouldy combs. Everything glistening with moisture and smelling to high heaven. A wonder that out of the 15 hives nine were still alive. These were full of honey from top to bottom (two supers = one half depth), with just little patches of brood in the bottom box. They were what is called honeybound. What waste, neglect, and irresponsibility. And when you think about it, what cruelty. Bees are living creatures. If the same sort of thing happened to mammals s.a., horses, dogs, sheep or cows a storm of public indignation would blow up. TV shots of it nationwide and MAF and the SPCA on the the scene. Prosecution would probably follow. In principle there is no difference but this was tucked away from the public eye.

A sample comb was taken from one of the dead hives because it looked suspicious, but because of its state no diagnosis was possible. It was mailed to our local district MAF office. It came back with the message that no obvious signs of BL infection were visible (which we knew) and, sorry, no funds were available to send the comb for lab testing. Inspection reports went to MAF, of course, and a note went to the hive owner. And that apparently is all the action that can be taken.

This hive owner, we won't call him a beekeeper, is guilty of negligence, is a menace to neighbouring beekeepers and practices extremely poor PR with land owners. There is no excuse whatsoever for this kind of situation. If one cannot take reasonable care of the livestock one is reponsible for there is only one alternative: pass on that responsibility to someone else who is capable, or at least will try to do his best to carry it. If selling hives is difficult they can be leased, share cropped, given away or, in the last resort the colonies can be destroyed in a humane way. Don't let them suffocate slowly and rot. How many swarms have issued, which means feral colonies to be cleaned up by others. What about the risk of spreading disease and spoiling good relationship between beekeepers and farmers.

Well, Kevin, if you still receive the Beekeeper I hope you read this, take notice, and pull up your socks. And please let none of us commit a similar offence.

BL infection through introduced queen bees?

Last winter, June/July, we decided to move to a more equitable climate for a while. There I had the pleasure to assist some of my beekeeping friends. A pleasure, for a change is as good as a holiday as they say. A very different set of conditions and environment combine to see certain aspects in a new light and one discovers that other ways of living and going about things get you there just as well.

One day we set out to check about 20 hives and a number of nucs (tops). What we found was not so good. The tops had been made in March/April. Some combs of brood had been taken from strong parent colonies and had been placed together with feed honey in a super. Enough bees were shaken in and the super put on top of the parent colony over a division board. Caged young mated queen bees with a small number of escort bees were introduced to these tops. These queens were im-

ported from New Zealand from one of our well-known queen breeders and one of good repute.

The sad thing was that we found four of the tops diseased, without a doubt it was *Bacillus Larvae* (American foulbrood). One would be inclined to think that the source of infection would be the parent colonies from which the combs with brood had been taken. However none of them showed any signs of infection.

The question arose: could the introduced queens and escorts have been contaminated? I had heard this asked before. From my own experience it is most unlikely. We have, over the years, received and housed many caged queens from this same queen breeder and from other sources and have never had a case where disease started from a bought-in queen. It would be much more logical to look for the cause at home. Probably it would be through the use of contaminated equipment s.a. supers from a dead hive, combs, re-used frames, etc. or feed honey coming from an unhealthy colony. The queen breeder will always make very sure that he operates with disease-free hives, uses safe candy (no honey), and new queen cages. He cannot afford to lose his/her good name.

What really is the risk of transmitting BL by introducing a queen with escorts? Experiments have shown that some 50,000,000 BL spores need to be introduced to a colony to cause an outbreak of the disease. That looks a lot but is not really because one scale of BL diseased pupae may contain 2,500,000,000 spores.

It has been found that an individual naturally infected adult bee carries 4,000 spores. A queen would not carry many more.

A caged queen with 10 escort bees could then carry 11 x 4,000 = 44,000 BL spores. These spores cannot reproduce in adult bees. Most of the spores are concentrated in the gut and excreted in the faeces instead of fed to larvae. It is extremely unlikely, if not impossible, that disease is spread in this manner even if the queen and escorts happened to be severely contaminated.

The conclusion is that we can discount the risk of spreading BL infection through the introduction of caged queens and escort bees if they come from a queen breeder using healthy stock, uncontaminated cages, and safe candy. So, with an easy mind, buy those queens from a good queen breeder and carry on with the fob of re-queening hives to improve your stock and increase that X number of Kg's of surplus honey.

Under the lid of one of the honey-bound colonies.

But watch your own management, how and what, you manipulate when working your hives. It is the beekeeper who is the greatest factor in the spreading of Bacillus larvae infections.

Ref. M. Hornitzky and E. Macarthur, The Australasian Beekeeper Vol. 92/87:271.

AGRICULTURAL FAN-SPRAY NOZZLES CUT DRIFT

Spray drift of agricultural chemicals in wind is reduced significantly by a British developed spray nozzle that can be fitted as a direct replacement for conventional nozzles without the need for any adaptor.

The Lo-drift nozzle tip, from Lurmark, differs from other drift-reduction systems which generally require expensive additional equipment or modifications to the sprayer.

The nozzles have been specially designed to produce a lower proportion of the small droplets - smaller than 100um (0.004in) diameter - that are prone to drift. Wind-tunnel tests have shown that spray collected downwind of Lo-drift nozzles was reduced by between 27% and 52%, depending on the size of the nozzle, compared with conventional fan nozzles of a similar capacity and spray-angle.

Since their launch over 200,000 Lo-drift nozzles have been sold in the UK by the company. As well as the environmental benefits, farmers using them have reported greater flexibility and confidence when spraying close to sensitive areas or susceptible crops, while maintaining very good biological results from the treatment applied.

Lo-drift nozzles are available in five sizes rated at 90, 120, 180, 240, and 300 litre/ha at 8km/h and they provide a 100 degrees spray angle at 3.0 bar spraying pressure.

No special techniques are needed to use the nozzles; all standard procedures recommended by the equipment manufacturer, the chemical manufacturer and governmental bodies continue to apply.

Southern North Island

Weather forecasters are blaming Mount Pinatubo's ash cloud in the upper atmosphere for the extended run of cold, wet, windy weather and they tell us it could be another two months before things come right.

Hives came through the winter in fairly good condition but vary from district to district. Hives that clustered early in the autumn (due to frosts) are now noticeably weaker as fewer adult bees made it through the winter. Pollen supplement certainly boosts hives along.

Most beekeepers are feeding hives to stimulate for kiwifruit production while others are feeding more than usual this year as some early sources were washed out. Pollination of stone fruit has been difficult to achieve. Looks like the season will be late again this year.

On top of the miserable conditions, getting bogged in pugged paddocks, there is also some uncertainty amongst North Island beekeepers about what effect the Kiwifruit Industry's talk of 10 to 20% pulling out of vines will have on their own businesses. Lets hope things around us stabilise quickly.

On the Branch front we have been fairly busy. Like all branches and the Executive we have put in many submissions to our parliamentarians regarding the proposed import of Australian honey. All this lobbying has to-date made MAF Qual rethink some of its ideas. We are continuing to apply the pressure in the hope that this draft is dropped altogether.

This issue has certainly made us politically aware. Members in Taranaki have turned DOC and the Regional Council around regarding a programme to 1080 poison possums. We all know the damage possums do to the bush and the effects they have on our ever decreasing bush. The Council proposed to start laying the baits around the Mountain in February while bees are still active and honey is still being extracted. It would have been a massive operation to move hives out of the affected area. Common sense and cool heads have seen them delay the poisoning until May.

Mark Goodwin and Cliff Van Eaton's travelling road show on identifying BL using bacterial cultures visited Wanganui on October 2 and was well attended. Very interesting, and some are proposing to use the technique.

Next day we held our Spring Field Day at Rob and Beth Johnson's property at Levin. Attendance figures just touched 80. Excellent day while the country side around us was windy and raining. Very informative and most hobbyists got hands-on experience indentifying what was wrong with half a dozen hives. The idea to produce regional labels, produce separate floral lines, and pool our surplus for export as a group was floated.

The Executive is looking at producing a "Standards" document in the new year to assist in the education of our industry and those authorities policing the many acts we work under.

We have been doing our bit by pushing the idea of adopting the ISO 900 series of standards. I believe there has to be a rethink of some of our processes especially when heating honey. An inspection of honey pots in the super markets around Wellington showed some packed lines had a distinctly burnt smell; clover honey wasn't all clover and some honeys just didn't look inviting. Our overseas customers wouldn't accept a product like this. If we want to keep our local market share we had better smarten up and pay more attention to detail. Producers should be justly proud of their product and packers should be more critical when buying in honey. Burnt lines should go into baked products. Only put first-class products on our supermarket shelves. Customers I talk to are not aware of the variety of flavours different sources have. Perhaps we should be promoting the in-store tasting of honey so the customers know what they are buying and come back for more sooner.

Research into active manuka honey is paying off in a practical way. No scar has formed on that part of a deep cut where our beekeeper used it religiously. Just another use for our versatile produce.

Frank Lindsay

South Canterbury

South Canterbury has experienced its coldest, longest winter for many years. The heaviest snowfall since 1973 blanketing the whole region.

This spring has been wet, cold, dull, miserable, muddy, depressing with hardly a sunny day until recently with the season being 3-4 weeks behind normal with beekeeping and cell raising almost impossible until October.
The flowering on the willows looks poor. Hives badly need a boost of pollen and nectar to bolster hive strength.

Peter Smyth

Canterbury

This spring has generally been wet and cold. Keeping yourself from getting stuck has been a priority while out among the hives. Most people started on time, but the wet weather meant that overtime had to be worked if we were not to fall behind. The hives opened up quite well considering the hard winter, and with plenty of stores. We thought we were off to a flying start, but pollen shortages, brought on by the bad weather, soon became apparent. The flow on effect made it a continuous battle to bring hives up to pollination standard.

With pollination now underway, and the willow flow pouring in on fine days, the season is here at last. Let's hope all this rain pays off as it usually does on the Canterbury Plains.

Richard Bensemann

Marlborough

The season started early, then came to a stop with a long and cool wet spell. The bees went back into winter mode, and who could blame them?

It's been a difficult spring working around the weather and trying not to get stuck in wet, puggy paddocks.

In some areas hives are light on stores and will need close monitoring, but with the warmer weather and the willow flow most bees are bursting ahead.

Commercial beekeepers are requeening with cells from local queen breeders thus allowing time for other jobs.

The AFB lab course was an enjoyable and worthwhile day.

On November 7, we are having our Spring Field day up the Kekerengu Valley where we will be discussing swarm control and keeping nectar sources separate in a mixed floral environment.

Mark Milne

Southland

Spring is with us and the winter weather is far behind. The bees are singing in the willows and daylight saving tells us it will soon be Christmas. Still there are not enough hours in a day. A severe winter and late start have left plenty of extra work for the Southland beekeeper. Most hives wintered well, but a few are light in stores and those beekeepers who manage to visit all their hives early in the season will save some from starving. The Southland Branch is doing a hive inspection — diseasathon, teaming up to inspect some of the hot spots on the MAF Map.

Alister Lee

Poverty Bay

Most beekeepers report that colonies came through the winter well. But the wet, cold spring so far has meant that they missed most of the willow flow and so it's sugar feeding in many cases. Here's hoping for a good run of weather into the honey flow.

The changing fortunes of the kiwifruit industry, will obviously have an effect of those who provide pollination services as part of their operations. Some vines have come out, most are still in and will of course need the bees for yet another and, hopefully, many more seasons.

Barry Foster, branch secretary, organised a petition objecting to the proposed government legislation to allow Australian honey imports, which was signed by 95% of commercial beekeepers in Poverty Bay, and presented to local MP Wayne Kimber. Radio and press releases were also used to make the public aware of our case.

What we all need is a bumper honey crop, and a price to go with it!

Peter Burt

North Otago

Because of the bad weather, we in North Otago are not having much success in completing spring work. Hives have wintered well but now require supplimentary feeding. The willow flowering is about three weeks late. However, there is plenty of moisture in the soil, so the clover might yield well. We look forward to a good season with hope in our hearts.

Local members are about to launch a diseaseathon to be followed by a BBQ at Brian O'Neill's honey house — when we get a fine Saturday.

Algie Lawrence

Nelson

After a very cold winter, spring temperatures are rising to an agreeable level. The weather was reasonable for the willow flow, and the barberry is on the brink of flowering. Colonies that have taken advantage of the willow have really rocketed along.

In some places queen mating programmes have dragged the chain, much to the disappointment of producers and buyers.

The rockbottom prices for kiwifruit will no doubt have a bad effect on beekeepers as well as kiwifruit growers. It is generally accepted that plenty of food in the hive during a cold winter means a live hive in the spring. But one beekeeper who does not remove honey, and is renowned for having fat colonies, has had considerable losses this year from starvation, That he has not experienced before.

On October 17 we intend to hold a field day for hobbyists. In spite of the drought that lasted well into winter we seem to have had sufficient rain to get things going again.

Ron Stratford

Westland

While other parts of NZ have experienced wet, cold weather with considerable snow to low levels, Westland, on the other hand, has faired somewhat

better than average to date. The latter half of winter and early spring have suited the bees, and therefore the beekeeper, quite well. Hive development is well-advanced and we have received fine, sunny days at the right time for queen mating. So, at least from that aspect, we haven't too many worries at present.

However, members are still concerned about the ever-increasing changes being forced upon us by the government or its agents. For example, the government seems determined to allow imports of honey from Australia. (Truly, where is the wisdom in that?) One would wonder which industry this is anyway. Should we not have the final say when determining the well-being of our industry? The saying holds true: 'where there is no wisdom the nation languishes'. We could add: 'where there are no statesmen we are left with politicians'.

Prospects for a crop this year? Anybody's guess. We do not expect any southern rata to show up, which limits our options somewhat, but given some reasonable weather during November and December we could come up with something like an average production.

Sandy Richardson

Otago

Winter has been long, cold, and wet and spring arrived two to three weeks later than usual. Colonies in inland, higher places have spent quite a bit of time under snow this winter and have come through with considerably less bees but with plenty of stores left so they will be needing sugar syrup to stimulate breeding.

A successful AFB disease training course was held recently at the Telford Rural Polytechnic. About 45 beekeepers attended from Southland, North, South, and Central Otago. The local branch is presently helping to set up three AFB disease inspection teams in Otago.

With plenty of moisture in the ground in the drier places and the warm days of spring finally arriving, we are looking forward optimistically to summer.

Bill Houston

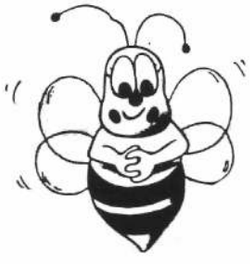
Otago

It is now October 5 and after some reasonably nice days it really looks as if the long, drawn out winter has left us. Winter 1992 has been a cracker. Colonies which were housed in good equipment and had plenty of stores have come through well but brood nests are slow in expanding, thanks to the many dull and cold days in August and September. No flights, no fresh pollen. It tells. Small colonies s.a. four frame nucs did not do well at all. Many ran out of tucker before time. Too much energy required to keep the temperatures up.

A post-conference meeting was held and fairly well attended. It was agreed to hold diseasethons in different areas, allocating branch members for the work in those localities, and following up with a branch get-together afterwards so that experiences can be exchanged and topped up with a bit of a social.

A number of branch members attended the 'hands-on' course for Detection of BL using Bacterial Cultures, held at Telford Polytechnic in September.

John Heineman



Waikato

As with probably every other district in New Zealand, the weather in the Waikato has be atrocious. We have several beekeepers with over 40 years experience in the Waikato and they all agree that this is the wettest coldest winter and spring they have ever experienced. On the law of averages the weather must improve — but when!!

In general winter looses have been more than most of us expected. Not only are hives starving and in need of inordinate amount of sugar, the number of queens failing is far greater than beekeepers have ever suffered before.

At the time of writing we have had six fine days, and with the willows now blooming, there is a lot of leeway to catch up. The five finger flowered well right through the cold, wet period but where bees were out gathering it? The broom is just coming into flower and this is a great source of pollen and has, in the past, been of great assistance in preparing hives for pollination.

This leads me to one of the problems facing beekeepers who depend on a great proportion of their income from kiwifruit pollination. You will have learnt from the news that overseas sales of kiwifruit have been disappointing not only in volume but in price. In result many growers will find difficulty in paying for hives.

From discussions with beekeepers I was interested to learn how many of them enjoyed Mark Goodwins seminars on A.F.B. It appears that the ancillary benefits of getting together provided the most interest, such as learning more about A.F.B. and where research was heading.

On Wednesday October 14, Waikato Branch held its Christmas Function. This year it was held on the vessel Waipa Delta on the Waikato River at Hamilton. We boarded at 6.30pm and cruised the river for over three hours which gave us all the opportunity of seeing an aspect of Hamilton that is not possible from the land.

This year 31 people enjoyed an excellent smorgasbord meal and the liquid refreshment made for a successful and memorable evening.

Here in the Waikato, in spite of our trials and tribulations we expect a good 1992/93 season.

Ron Blackman

Auckland

Despite the poor weather in August/September hives are doing well with adequate pollen, though more than usual amounts of sugar are being used to get them through. The willow flow was minimal and now that the weather seems to have come right the barberry is looking good. Queens were slow or failed to get mated.

The kiwifruit situation is very tight with some drop in hive numbers going in, although growers are opting to cancel artificial pollination rather than bees. I guess a few more hives will be on honey production.

This must be the toughest time of the year for beekeepers'. Other that the weather, the overdraft, late nights shifting hives into kiwifruit, controlling swarms and last but not least are all the parties which seem to become far more frequent from now until Christmas. So even if you have got half of last years crop still in the shed or your biggest kiwifruit orchard just cancelled its order because someone undercut the price don't forget to put a bit of time aside to have a good time.

Nigel Birse

COLIN McLEAN'S THING

I first became interested in bees about 10 years ago while living on a lifestyle property north-west of Brisbane. We kept the beehives on stands about 30cm off the ground. Underneath lived some very fat can toads, who liked eating bees. The first queens I bought there were from a couple who appeared to be in their seventies and the one thing I remember them saying is "you always have something new to learn when keeping bees — no matter how old you are."

Soon after I returned to New Zealand and bought five hives. While working on my parents' orchard, I spent a lot of time with the bees which slowly began to increase their numbers. The queen-raising part of beekeeping interested my. Perhaps it was the challenge, and being fortunate enough to know Don Gibbons, who introduced me to raising queen bees, I started in the direction I am now going.

My business is an intensive operation and fairly diverse. Some 150 hives are kept at Tarawera, in the mountains halfway to Taupo, and the rest of my hives are down on the flats in spring and into the foothills for summer. About 80 hives go on pollen traps and about 300 into orchards in spring.

My queen raising is done just north of Napier, on a large Landcorp farm which, before the 1931 earthquake, used to be under water. Even the drains, which are two km from the sea, are full of salt water. Luckily the manager is very helpful. He also eats nearly a kilo of honey a week, so we both have something to trade.

Nuc's are set up in spring with brood, bees, pollen and a frame of honey, it's a big job setting them up but once going they can be maintained through summer. Queens are raised late into autumn, and are either sold locally or exported. The nucs are then stacked up for winter, or moved into town to build-up over winter and early spring.

Queen bee production is probably the hardest way to earn a living from bees, its certainly very demanding and intensive work. Why do I do it? I guess it has a future (or I hope it has) and because I enjoy doing it. To be involved in the breeding and selection of bees which will show results in the next generation is very rewarding.

Hives holding Colin McLean up.

At a Pork Industry demonstration stand. Could it be Hungry-looking-new-executive-member Richard Bensemann staring at the camera?

EXPORTING

The NBA has, with the assistance of its members, established an export liaison group. This group will assist members who:

a) may be considering exporting

or

b) wish to discuss an exporting matter with someone else in the industry.

The following members will be pleased to provide information for members new and inexperienced in the export of honey.

ORGANISATION	CONTACT PERSON	TELEPHONE NO.	FAX NO.
Airborne Honey	Peter Bray	(03)243569	(03)324236
Arataki Honey	Percy Berry	(06)8775400	(06)8774200
Ceracell Products	Stephen Mahon		(09)2740368
Kintail Honey	Dudley Ward	(06)3748301	(06)3748256
	James Ward	(0728)58038	
NZ Honey Producers Co-Op	Steve Lyttle	(03)6848882	(03)6884859
Southern Honey Exports	Allen McCaw	(03)4177198	(03)4177198
Waitemata Honey	Neil Stuckey	(09)4038491	(09)4738556

CHRISTMAS FARE

By Sue Jenkins

The festive season is fast approaching. Christmas cakes are best made well in advance and wrapped and stored to allow the flavours to mature. Likewise with the traditional Christmas pudding. Christmas mince pies, I make 2-3 weeks in advance and freeze — taking the number I require at the time, thaw and warm to serve.

When the school year is finished, I make Lebkuchen with the children, and what fun they have. Every now and again we find a hungry person has had a bit of a nibble at the Christmas tree decorations.

A fruit compote using our inseason ripe fresh fruit with a honey cream on hot summer's Christmas day is most acceptable and easy to prepare. Io savour the flavours of the Christmas dinner or when having guests for drinks, Mazuka makes a wonderful Christmas after dinner treat with coffee.

Traditional Christmas Pudding.

This can be made well in advance, stored, then resteamed on the day of use.

2 cups flour
¾ cup shredded suet or 75g butter
½ cup brown sugar
1 cup raisins
1 cup sultanas
1 cup currants
¼ cup mixed peel
¼ cup cherries
1 tsp cinnamon
1 tsp mixed spice
½ cup honey
½ cup milk
1 tsp baking soda
2 eggs
1 orange rind finely grated
1 lemon rind finely grated

Rub flour, suet, and brown sugar together in a large bowl. Add to this the fruit and stir in the spices. Warm the golden syrup, add milk with the baking soda dissolved in it, the eggs and the rind, beat with a fork until the eggs are blended with the other ingredients. Pour in the dry ingredients and fruit. Grease a large bowl and put the mixture into it, leaving enough space for the pudding to rise as it cooks. Cover the basin with a lid or with foil. Place on a rack in a large saucepan, half fill with boiling water. Put a lid on the saucepan and boil gently for 3-4 hours, checking frequently to see that the pudding has not boiled dry. When necessary add more boiling water.

Remove from basin and leave to cool on a wire rack. When cold, wrap in aluminium foil or in a plastic bag and keep it in a cool place until it is needed. (In the refrigerator or even in the freezer). When the pudding is to be used, unwrap it, sprinkle with sherry, whiskey or brandy, replace it in the basin with a tight covering lid and steam again for 1-3 hours (the longer the better).

Serve hot with a suitable garnish or 'flame' the pudding. To do this heat 2 or 3 tablespoons of brandy or Irish Mist liqueuer, pour over the Christmas pudding and light with a match.

Traditional Honey Christmas Cake.

3 cups raisins, chopped
1½ cups sultanas
¾ cup currants
¾ cup dates, chopped
⅔ cup glace cherries, halved
⅔ cup dried apricots
⅔ cup ginger in syrup, chopped
½ cup dark rum
250g butter
1 cup honey
4 eggs
1 tsp almond essence
½ cup walnuts chopped
2 cups wholemeal flour
¼ cup cornflour
2 tsp ground mixed spice
1 tsp nutmeg
½ tsp baking soda
extra glace cherries and walnut halves for decoration.

Place the prepared raisins, sultanas, currants, dates, cherries, apricots, and ginger into a bowl, add rum and let them stand covered for 24 hours.

Cream butter and honey together, add eggs one at a time and then the almond essence. Continue beating until the mixture is light and creamy. Stir in walnuts. Add sifted dry ingredients, then the fruit. Turn into a prepared 20cm cake tin. Decorate with extra cherries and walnuts. Bake for 3 hours at 150C. Remove the cake from the oven, wrap in a tea towel and let it cool in the tin.

Christmas Mince Pies

Enough for one large pie or 12 small pies. Decorate the top of the pie with star shapes.

Pastry:
180g butter cubed
¼ cup icing sugar
2 egg yolks
2 tablespoons milk approximately
1½ cups self-raising flour
⅔ cup cornflour
Filling;
½ quantity of Christmas mince meat
Glaze:
1 egg beaten with 1 tablespoon water

Pastry; Sift self-raising flour and cornflour together into a bowl or food processor. Chop butter until it resembles coarse breadcrumbs. Mix in icing sugar. Add egg yolks and sufficient milk to make a stiff dough. Wrap dough in plastic wrap and chill for 30 minutes. Roll to desired shape. Cut stars also. Fill with Christmas mince meat.

Bake at 190C for 30-35 minutes. Dust with icing sugar.

Christmas Mince.

200g currants
200g dried apricots finely chopped
100g large soft raisins, finely chopped
150g glace cherries, roughly chopped
1 teaspoon lemon rind
3 apples grated
2 tablespoons honey
¼ cup orange juice
½ cup brandy
1 cup toasted almonds (optional)

Place the ingredients, except the nuts in a basin and stand for 24 hours. Place in a food processor and pulse 3-4 times to roughly mix. Store in the refrigerator until required. Add the nuts when ready to cook.

Mazurka

Served with Christmas Coffee, Mazurka won't last for long.

¾ cup currants
¾ cup sultanas
¾ cup seedless raisins
¾ cup chopped dates
½ cup chopped figs
¾ cup roughly chopped almonds
¾ cup chopped mixed peel

½ cup glace cherries
½ cup chopped glace pineapple
½ cup chocolate bits
1 tsp mixed spice
1¼ cups flour
3 eggs
¼ cup liquid honey.

Put the currants, sultanas, raisins, dates, figs, almonds, mixed peel, cherries, pineapple and chocolate bits in a large bowl. Sift the mixed spice and flour together and stir into the dried fruits. Beat the eggs and add to the dry ingredients with the honey. Mix until well combined. Press the mixture evenly into a greased and lined 22cm x 32cm sponge roll tin. Bake at 140 C for 45 minutes-1 hour or until firm to touch. Cool in tin. Cut into bars when cold. Store in an airtight container in the refrigerator.

Lebkuchen

Traditional German Christmas cookie, decorated and hung on the Christmas tree.
¾ cup honey
½ cup brown sugar
2 tbsp water
25g butter
3½ cups flour
½ teaspoon baking soda
pinch salt
½ teaspoon mixed spice
¼ teaspoon ground ginger
½ teaspoon ground cinnamon

Put honey, sugar, water, and butter into a saucepan and heat gently until mixture comes to the boil, stirring constantly. Remove from the heat and allow the mixture to cool to lukewarm. Sift flour, baking soda, salt, mixed spice, ginger and cinnamon into a bowl. Make a well in the centre. Pour heated ingredients into the well. Blend together until well combined. Wrap dough in plastic wrap and refrigerate at least one hour. Roll mixture out on to a lightly floured board to 1cm thickness. Use starshape cutters to cut out shapes. Place on a lightly greased tray. Decorate each biscuit with half a glace cherry or ice when cold. If you pierce a hole at the top they they can be hung on the christmas tree. Bake at 150 C for 10-15 minutes or until pale golden.

Fruit Honey Compote

A refreshing summer Christmas dessert served with honey cream. Other fresh, ripe in season, fruit can also be used.
250g fresh ripe apricots, diced
250g fresh ripe plums, diced
½ cup blue berries
¾ cup water
¼ cup clover honey

Dissolve the honey in the water. Add prepared apricots and plums, simmer gently until just tender. Add blueberries. Remove from the heat. Serve chilled with honey cream or serve in a brandy basket or flower or in a chocolate cup. (Serves 6-8).

Honey Cream
½ cup sour cream
½ cup whipped cream
1 rounded tablespoon clover honey
½ teaspoon vanilla essence

Combine in a bowl and beat until soft peaks form.

BARRIER GEL FOR COCKROACH SPRAY

A barrier gel for the prevention and control of cockroaches, termites and other insects is available from a British company.

Pestrin, from Hughes and Hughes, contains 2% of active Permethrin enclosed in a water-repellent thixotropic material which protects it against loss or decay through exposure to the atmosphere.

Despite its high presticide power, Pestrin is not harmful to mammals. It is easy to apply and has a long active life. It is applied as a barrier to prevent pests passing over or through it into areas used for the preparation and storage of food, and can also be used to isolate pests inaccessibly concealed within the fabric of a building or to prevent colonisation in the first place.

Pestrin brings dual benefits, acting as either a barrier to deter pests or as a source of the active insecticide which is released when insects disturb the surface. It retains its passive activity for an extended period.

The gel remains stable in the temperature range from -10°C to 100°C, which makes Pestrin suitable against a range of pests that thrive in a variety of environmental conditions. Its resistance to water makes it ideal for use in damp or humid areas or with floors that are washed frequently. It is virtually odourless and produces no irritating vapour.

Unlike most insecticides, Pestrin does not require special equipment. It can be put down with a brush, scraper or pressure pump depending on the nature and area of the surface to be treated. It can adhere to walls and ceilings. Pestrin is available in 5 litre pails or 320ml cartridges.

LIBRARY NOTES

From the Library of the Cowthron Institute we received a number of beekeeping magazines. They were very welcome as they helped fill some gaps and completed some volumes, especially of early NZ Beekeeping journals. GENETIC IMPROVEMENT OF HONEY BEES IN NEW ZEALAND by B.P. Oldroyd, 1988, 39pp. A photo copy of a consultancy report for the NZ Beekeepers' Association. (The library should have had this much earlier as it was requested a few times. DETECTION OF AMERICAN FOULBROOD USING BACTERIAL CULTURES — LABORATORY MANUAL. by R.M. Goodwin and Cliff van Eaton, 1992, 20 pp. A very useful document. Those of us who attended the day courses held throughout the country will know how this technique promises to be a valuable tool in reducing the incidence of B.L.

Classified Advertisements

Available only to registered beekeepers selling used hives, used plant, and other apiary equipment, and those seeking work in the industry. $17.50 for 20 words (inclusive of GST) payable in advance. No discounts apply. No production charges. Maximum size: 1/6 page. No box number available.

FOR SALE

Beehives 400 plus supers on sites in Otago or for removal $95 each. Derek Crawford, Braudigan Road, RD Tapanui 9157

Beekeeping Business in sunny Bay of Plenty. Hives and plant in top condition. 1100 two storey full depth hives and 1400 honey supers, pollination work for 1200 hives, 1990 Ford trader truck fitted with hive lifter, all remaining plant. For further details phone (07) 533-1433.

WANTED TO BUY

Bulk honey for confirmed export order. Up to 100 tons needed. Please contact Brian Smith, Gisborne Honey Producers Ltd, Phone 06-867-3769, Fax 06-867-3769.

OTHER PUBLICATIONS

INDIAN BEE JOURNAL

International in appeal; keeps you update with beekeeping developments in India and the World. Publishes research on Asiatic Honeybees, tropical apiculture and pollination. Solicites your support and welcomes your subscription:

BEE CRAFT

The official monthly journal of the British Beekeepers' Association, covering all aspects of beekeeping in the UK. Annual subscription including postage $37 surface mail $69 air mail to Mrs S. White, 15 West Way Copthorne Bank, Crawley, West Sussex RH10 3QS. Our editor has advised that he has not received a copy of your journal for the last six months. Please could you arrange to resume delivery to him. His name and address are as follows:— Mr R. Young, 23 Beaconsfield Rd, Vincent Park, Sittingbourne, Kent ME10 3BD.

INTERNATIONAL BEE RESEARCH ASSOCIATION (IBRA)

What do you know about the INTERNATIONAL BEE RESEARCH ASSOCIATION? The many books and other publications available from IBRA will deepen your understanding of bees and beekeeping. An IBRA membership subscription — including BEE WORLD, a truly international beekeeping magazine published quarterly in the English language — will broaden your beekeeping horizons. Details and a wide selection of books and publications from New Zealand IBRA representatives, Cliff Van Eaton, MAF, Private Bag, Tauranga or Peter Brunt, Nelson Polytechnic, Private Bag, Nelson.

OTHER PUBLICATIONS

THE APIARIST

A New Zealand Beekeeping Journal. Published every two months. Contains informative and interesting articles on beekeeping in New Zealand and overseas. Subscriptions: Free to all registered beekeepers in New Zealand with six hives or more. $5.00 per annum, if less than six hives. Write to: The Editor, "The Apiarist", P.O. Box 34, Orari, N.Z.

SOUTH AFRICAN BEE JOURNAL

The leading bee journal in Africa for over 75 years. Official organ of the Federation of Beekeepers' Associations, published bimonthly in English and Afrikaans. Primarily devoted to the African and Cape bee races. Subscription, including postage: R35.00 per annum, payable in advance in South African Rands. Apply: The Federation Secretary, PO Box 4488, 0001 Pretoria, South Africa.

AUSTRALASIAN BEEKEEPER

Senior Beekeeping Journal of the Southern Hemisphere. Complete coverage of all beekeeping topics in one of the world's largest beekeeping countries. Published monthly by Pender Beekeeping Supplies P/L, P.M.B. 19, Gardiner St., Maitland, N.S.W. 2320 Australia. Subscription by Bank Draft. $US27.00 surface per annum.

FARMING UNCLE

Magazine for homesteaders! Covering small stock, gardening, bees, and much, much more. Free information or $US8.00 one year ($US12.00 foreign). Money-back guarantee! Farming Uncle, ®, Box 91E92, Liberty, N.Y. 12754, USA.

THE SPEEDY BEE

Keep up with the latest in the United States beekeeping industry with reports of meetings and developments from The Beekeepers' Newspaper. Published monthly. $20.00 per year (mailed First Class). Write for air mail rates. The Speedy Bee, P.O. Box 998, Jesup, Georgia 31545 USA. Write for free sample copy.

OTHER PUBLICATIONS

SCOTTISH BEE JOURNAL

Packed with practical beekeeping. $4.80 a year from the Editor, Robert N. H. Skilling, F.R.S.A., F.S.C.T. 34 Rennie Street, Kilmarnock, Ayrshire, Scotland.

BRITISH BEE JOURNAL

Monthly — Single copies 22p plus postage. OVERSEAS: Annual subscription 4.20 sterling or $18.40 post paid. Keep up to date by taking out a subscription now from us at — 46 Queen Street, Geddington, Northans, NN14 1AZ, England.

GLEANINGS IN BEE CULTURE

Do you have questions or problems about beekeeping in different areas? Learn how to solve them by reading "Gleanings in Bee Culture", the largest circulation English language bee journal, and made up of articles by well-known professors and beekeepers, like yourself, who tell how they have succeeded in beekeeping. For Subscription rates write to: Gleanings in Bee Culture, P.O. Box 706, Medina, Ohio 44258, USA.

BEE WORLD

World renowned, world respected. A truly international beekeeping magazine published quarterly in the English language. Included as part of membership in the International Bee Research Association (IBRA), the world's leading charitable trust providing scientific and practical information on bees and beekeeping. For full details of IBRA services and membership contact: International Bee Research Association, 18 North Road, Cardiff CF1 3DY, UK. Tel: (0222) 372 409 Fax: (0222) 665 522 or New Zealand IBRA representatives, Cliff Van Eaton, MAF, Private Bag, Tauranga or Peter Brunt, Nelson Polytechnic, Private Bag, Nelson.

THE SCOTTISH BEEKEEPER

Monthly Magazine of the Scottish Beekeepers' Association. International in appeal, Scottish in character. Subscription rates from: D.B.N. Blair, 44 Dalhousie Road, Kilbarchan, Renfrewshire, PA10 2AT, Scotland, U.K. Sample copy on request — $1 or equivalent.

AMERICAN BEE JOURNAL

Subscribe now to the oldest bee magazine printed in the English language. Amateur, professional and scientific news makes ABJ an attractive buy for any beekeeper. World-wide crop and market page an outstanding feature. The American Bee Journal is the largest monthly apiculture magazine in the world. Enquiries to American Bee Journal, Hamilton 1U.62341 USA.

HONEY INDUSTRY TRUST

Honey Industry Trust applications close twice a year, on February 15 and August 15.

Application forms are available from the NBA, Box 4048, Wellington.

Applications will be considered within six weeks of receipt of recommendations from the NBA Executive.

PRICE LIST
AS AT NOVEMBER 1992

		Excl. GST	Incl. GST
BEE BLOWERS			
Spare Hoses	each	60.62	68.20
Spare Nozzles	each	13.82	15.55
BEE ESCAPES			
Porter or Round Plastic	each	2.62	2.95
	per 10	23.91	26.90
Round Galvanised	each	3.11	3.50
	per 10	28.00	31.50
Eight Way Plastic	each	4.18	4.70
	per 10	37.78	42.50
BEE ESCAPE BOARDS Complete			
Porter or Round Plastic Bee	each	6.53	7.35
Escape mounted in a Hive Mat	per 10	61.16	68.80
Round Galvanised Bee Escape	each	7.11	8.00
Mounted in a Hive Mat	per 10	65.33	73.50
Eight Way Plastic Bee Escape	each	8.44	9.50
Mounted in a Hive Mat	per 10	76.00	85.50
BOTTOM BOARDS			
Commercial Type	10	66.00	74.25
With tanalised bearers	100	600.00	675.00
Reversible Type	each	7.96	8.95
	per 10	76.18	85.70
BOOKS ON BEEKEEPING			
ABC and XYZ of Bee Culture - A.I. Root	each	73.33	82.50
Arthritis - Malone	each	28.66	32.25
Apiaries Act - May 1987	each	4.67	5.25
Beekeepers Handbook - Sammataro	each	51.11	57.50
Beekeeping Questions and Answers	each	29.69	33.40
Bees, Vision, etc - Frisch	each	29.55	33.25
Beeswax - Taylor	each	7.56	8.50
Contemporary Queen Rearing	each	38.67	43.50
Cookin' with Honey	each	6.93	7.80
First Lessons in Beekeeping	each	7.91	8.90
Hive and the Honey Bee	each	112.44	126.50
Honey Bee Brood Diseases	each	20.44	23.00
Honey Bee Colouring Book	each	1.78	2.00
Honey Bee Study Prints	per set	77.33	87.00
Honey for Health - Tonsley	each	8.44	9.50
Honey in the Comb	each	29.69	33.40
Honey Wines & Beers	each	28.86	32.25
Honey & Health	each	13.11	14.75
How to make Beeswax Candles	each	8.53	9.60
Life of the Honey Bee	each	6.93	7.80
Making Mead	each	19.38	21.80
Manual for NZ Beekeepers 1848	each	35.11	39.50
Nectar and Pollen Sources of NZ	each	3.51	3.95
Practical Beekeeping - Chapman Taylor & Davey	each	35.51	39.95
Putting it up with Honey	each	23.96	26.95
Queen Rearing Simplified	each	21.33	24.00
The Honey Kitchen	each	22.67	25.50
The Wonderful World of Honey	each	22.67	25.50
Wall Cahrt - The Life Cycle	each	22.18	24.95
BRUSHES			
Holterman - Standard	each	12.67	14.25
Holterman - Long	each	14.44	16.25
CAPPINGS SCRATCHER	each	12.00	13.50

COMB FOUNDATION	Sheets per Kg approx	Price per Carton	Price per Kilogram
'Acron' Weed Process	Kg approx	Carton	per Kilogram
F.D. Medium Brood Carton Lot	17.5	*12.5	9.96 11.20
F.D. Medium Brood less than Ctn Lot	17.5	12.5	10.76 12.10
¾ Medium Brood Ctn	23	12.5	9.96 11.20
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1-9	each	13.11	14.75
10-49	each	11.47	12.90
50 and over	each	10.93	12.30
Unassembled 50 and over only	each	10.74	12.08
Extra Wood Frames for above	each	1.24	1.40
	per 10	10.40	11.70
	per 100	91.56	103.00
FEEDERS			
PLASTIC FRAME TYPE			
F.D. 8 litres and F.D. 5.5 litres	each	9.42	10.60
	10	85.78	96.50
	100	790.00	888.75
F.D. 3.5 litres and ¾ D. 4 litres	each	8.71	9.80
	10	79.20	89.10
	100	750.00	843.75
ENTRANCE	each	3.11	3.50
	10	29.78	33.50
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Hoffman Full Depth, Three Quarter Depth and Half Depth			
Section Frames Full and Half Depth, Manley Three Quarter Depth			
(100 per Bulk Carton)	10	9.33	10.50
	100	66.58	74.90
	1000	594.67	669.00

Note: Full Depth Hoffman Frames are supplied with Three Hole, 33mm End Bars
Frames with Four Hole or 35mm End Bars are available on request at no extra cost

FRAME PARTS Hoffman			
End Bars	100	15.64	17.60
	1000	142.20	160.20
Bottom Bars	100	15.07	16.95
	1000	137.11	154.25
Top Bars	100	28.27	31.80
	1000	256.44	288.50
FUMIDIL B			
0.5g Bottles	each	17.33	19.50
19.5g Bottles	each	124.00	139.50
GLOVES Leather Ventilated Beekeeping			
Small, medium, large, extra large	pair	39.82	44.80
HATS Ventilated Bee Helmets			
Woven Fabric	each	23.56	26.50
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Complete Two Storey Hive (A6)	each	91.11	102.50
HIVES MATS (22 per Carton)			
Hardboard with Wood Rim	each	3.96	4.45
	10	34.53	38.85
	100	310.67	349.50
Frames only for Hive Mats	each	1.42	1.60
	10	10.84	12.20
	100	100.89	113.50

		Excl. GST	Incl. GST
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EMLOCK TYPE			
Complete with Galvanised Strapping	each	7.91	8.90
	10	75.11	84.50
	100	695.00	781.88
Without Strapping	each	6.00	6.75
	10	54.22	61.00
	100	510.00	573.75
Extra Galvanised Strapping	per lgth	1.24	1.40
	per kg	4.89	5.50
	50kg	195.00	219.38
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Complete with Four Metres of Nylon	each	4.00	4.50
Strapping and Plastic Buckles	10	35.55	40.00
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'Kelley' 10 Inch	each	11.73	13.20
'Maxant' 10 Inch with Hook	each	20.09	22.60
HONEY CONTAINERS			
Cut Comb Boxes (250 per Carton)	each	69	.78
	250+	58	.65
140gm Clear Plastic Polyjars	each	36	.41
with White Screw Caps	100	32.00	36.00
250gm Clear Plastic Polyjars	each	40	45
with White Screw Caps	100	36.00	40.50
500gm Clear Plastic Polyjars	each	40	45
with White Press On Lid	100	36.00	40.50
500gm Clear Plastic Polyjars	each	44	.50
with White Screw Caps: Square or Hex	100	40.00	45.00
1kg Clear Plastic Polyjars	each	.80	.90
Hexagonal with White Screw Caps	100	66.00	74.25
500gm Plastic Safe-A-Pak	100	26.22	29.50
Coloured with White Lids	1000	213.33	240.00
500gm Squat Clear Plastic	100	33.33	37.50
Safe-A-Pak with White Lids	1000	256.00	288.00
1kg Plastic Safe-A-Pak	100	44.27	49.80
Coloured with White Lids	1000	360.00	405.00
2kg Plastic Safe-A-Pak	each	.84	.95
Coloured with White Lids	200	149.33	168.00
2kg Pre-printed with New Zealand	each	95	1.07
Honey	200	167.11	188.00
6kg Plastic Safe-A-Pak	each	2.67	3.00
Coloured with White Lids	100	195.56	220.00
30kg Polypails Plastic	each	11.73	13.20
White with White Lids	per 10	105.78	119.00
HONEY CONTAINERS			
2kg Plastic Safe-A-Pale Pre-printed with "Pure New Zealand Honey"			
HONEY EXTRACTORS			
Lega Four Frame Stainless Steel			
Hand Driven	each	617.78	695.00
Ecroyd's Four Frame Plastic Hand Driven	each	381.33	450.00
Replacement Gears for Extractors			
- Nylon	per set	14.67	16.50
- Metal	per set	70.67	79.50
Clear Hinged Covers	per set	32.00	36.00
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60mm OD	each	53.24	59.90
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25mm ID		30.05	33.80
32mm ID		41.60	46.80
38mm ID		54.84	61.70
51mm ID		87.56	98.50
NYLON THREADED WITH BACK NUT			
47mm OD	each	21.69	24.40
60mm OD	each	31.56	35.50
HONEY LABELS			
'Pure Honey' 75mmx60mm	10	*1.07	1.20
	100	8.89	10.00
HONEY PUMPS			
Ecroyd's Gear Type	each	475.00	534.38
Honey Pump Unit Complete	each	POA	POA
Lega, 2000kg per hr, complete		1800.00	2025.00
Mono, Complete or Bare	each	POA	POA
HONEY STRAINERS			
28 Mesh Nybolt for Polypail	each	20.27	22.80
Nybolt strainer bags - made to order		POA	POA
HONEY REFRACTOMETERS			
Kikuchi or Atago (Price on application) approx		550.00	618.75
HONEY TANKS			
Plastic 30kg with lid			
and 47mm Honey Gate	each	33.42	37.60
Stainless Steel, with lid, gate and stand	50g	149.00	167.63
	100kg	199.00	223.88
	200kg	279.00	313.88
	400kg	499.00	561.38
METAL REBATES	pair	93	1.05
	per 100	39.07	43.95
MOULDS			
WaX Mould, Five Rectangular	each	6.93	7.80
Wax Mould, Six Hexagonal	each	13.78	15.50
Wax Mould, Three Hexagonal	each	13.78	15.50
Queen Cup Wax Mould	each	21.22	23.90
Candle Mould - Large Skep	each	20.18	22.17
Candle Mould, Hive	each	20.18	22.70
MOUSE GUARDS	each	1.73	1.95
	10	15.56	17.50
NAILS (Prices per kg)			
FLAT HEAD VINYL COATED			
12 x 1 per kg		17.33	19.50
12 x 1.0 25 kg Case		389.33	438.00
30 x 1.6 per kg		9.73	10.95
30 x 1.6 25 kg Case		222.00	249.75
40 x 1.6 per kg		10.00	11.25
40 x 1.6 25 kg Case		228.00	256.50
60 x 2.5 per kg		4.62	5.20
60 x 2.5 25 kg Case		93.78	105.50
FLAT HEAD GALVANISED			
50 x 2.5 per kg		7.82	8.80
50 x 2.5 25 kg Case		163.56	184.00
60 x 2.5 per kg		5.87	6.60
70 x 2.5 kg Case		121.33	136.50
60 x 2.8 per kg		4.80	5.40
60 x 2.8 25 kg Case		97.33	109.50
NUC BOXES			
Galy Entrance Disc	each	1.42	1.60
	10	11.82	13.30
Wooden Five Frame Box and Bottom	each	12.00	13.50
no Roof	10	115.56	130.00
OVERALLS			
White Cotton or Polycotton, Zip Up Overalls, Sizes 5 to 12			
Firsts	pair	48.00	54.00
P.D.B. (Paradichlorbenzene) Wax Moth Exterminator			
1 kg	each	7.11	8.00
2.5 kg	each	16.40	18.45
25 kg Bag	each	132.89	149.50
PARAFFIN WAX			
28 kg Carton	per kg	2.93	3.30
Less than Carton Lots	per kg	3.47	3.90
POLLEN TRAPS	each	60.89	68.50
PRICKER			
Revolving for use with Thioxotropic Honey	each	190.00	213.75
QUEEN REARING MATERIALS			
Jenter Complete Unit including 100 Plugs, 100 Cups, 90 Cup Holders and Pre-Dawn Comb	each	124.00	139.50
Jenter Extra Plugs	per 100	15.73	17.70
Jenter Extra Cups	per 100	15.73	17.70
Jenter Extra Cup Holders	per 50	15.73	17.70
Jenter Queen Clamp	each	18.00	20.25
Plastic Cell Cups	each	.15	.17
	per 100	13.24	14.90
Bozi Cell Cups	each	.15	.17
	per 200	25.07	28.20
Bozi Cell Bars	each	1.60	1.80
Chinese Grafting Tool	each	5.78	6.50
Grafting Brush 000, Sable	each	5.42	6.10
Grafting Brush 000, Synthetic	each	4.27	4.80
QUEEN CAGES			
White Two Piece	per 10	4.49	5.05
	per 100	40.80	45.90
Brown One Piece	per 10	4.00	4.50
	per 100	33.73	37.95
RATCHET TIE DOWNS			
25mm, Five Metre, 1200 kg	each	19.20	21.60
50mm, Six Metre, 2000 kg	each	48.00	54.00
50mm, 8.5 Metre, 2000 kg	each	56.00	63.00
ROOFS (10 per Carton)			
Without Iron	each	8.98	10.10
	per 10	88.44	99.50
Iron Only	each	6.67	7.50
	per 10	60.00	67.50
Plastic Roofs	each	14.66	*16.50
	10	133.33	150.00
Tin Roofs	each	10.40	11.70
	10	84.00	94.50
	100	790.00	888.75
SCRAPERS			
Wooden Handles with Metal Blade			
Four Inch	each	13.29	14.95
SECTIONS Fine Sawn Finish			
With Foundation Slit	100	23.91	26.90
	1000	198.67	223.50
	10000	1805.78	2031.50
Without Foundation Slit	100	21.78	24.50
	1000	178.80	201.15
	10000	1625.78	1829.00
SEPARATORS	each	.53	.60
	100	45.24	50.90
SMOKERS			
80mm Galvanised	each	33.33	37.50
100mm Galvinised with Shield	each	41.24	46.40
80mm Stainless Steel with Shield	each	48.27	54.30
100mm Stainless Stell with Shield	each	50.58	56.90
Replacement Bellows - Lega	each	21.24	23.90
- Dadant	each	35.11	39.50
STICKERS			
Lega Bee 100mm	each	.53	.60
	10	4.44	5.00
Lega Bee Large	each	3.38	3.80
STINGOSE			
Spray-on Lotion to minimise swelling from stings and bites	each	6.18	6.95
STOREYS			
LOCK CORNERED,¾ Inch Rebates (Metal Rebate required)			
Full Depth 1-9	each	11.51	12.95
10-49	each	11.07	12.45
50 and over	each	10.04	11.30
COMMERCIAL TYPE with Half Check Corners and ½ Inch Rebates (¾ Inch Rebate available on orders of 50 and over)			
Full Depth 1-9	each	9.73	10.95
10-49	each	9.02	10.15
50 and over	each	8.22	9.25
Three Quarter Depth 1-9	each	8.09	9.10
10-49	each	7.56	8.50
50 and over	each	6.89	7.75
Half Depth 1-9	each	6.53	7.35
10-49	each	6.18	6.95
50 and over	each	5.56	6.25

Note: Metal Rebates EXTRA, if required, on ALL Storeys

TOGGLE CLAMPS			
For Wiring Boards	each	34.67	39.00
UNCAPPING EQUIPMENT			
24 foot Heat Tape	each	112.00	126.00
Electric Uncapping Knife	each	146.67	165.00
Steam Heated 10 Inch Knife	each	65.33	73.50
Plain Medium Duty Knife	each	29.96	33.70
Steam Hose	per metre	4.89	5.50
VEILS			
Standard Wire Mesh	each	11.78	13.25
Woodman Wire Mesh	each	12.67	14.25
Round Plastic Mesg	each	14.67	16.50
Hood, Long Sleeved	each	74.22	83.50
Suit, One Piece, Sizes Five to 12	each	101.33	114.00
WASP KILLER			
250ml Bottles, No Wasp	each	12.00	13.50
100g Jar, Carbaryl	each	7.02	7.90
Two kg Box Carbaryl	each	68.44	77.00
WICK - per metre	each	.45	.50
per roll (approx 100m)	each	35.11	39.50
WIRE 0.46mm Galvanised Frame Wire			
200g Reels	each	4.40	4.95
400g Reels	each	7.56	8.50
3.0 Reels	each	39.11	44.00
WIRE CRIMPER			
Plastic	each	22.04	24.80
Spare wheels for above	pair	7.56	8.50

NOTE: Freight or postage is additional to the above prices.

Ecroyd Beekeeping Supplies

P.O. Box 5056, Papanui, Christchurch Telephone (03) 358-7498, Fax (03) 358-8789
26B Sheffield Crescent, Burnside, Christchurch, New Zealand. Hours 8.30am-5.00pm Monday - Friday