MAF Report

ORGANISATION AND STAFFING

During the year the Ministry of Agriculture & Fisheries underwent a massive reorganisation and restructuring. The 10 divisions in MAF were reduced into four business units viz. MAFTech, MAFQual, MAFFish, and MAFCorp. The AAOs have been placed in MAFQual with the exception of the Nelson position which remained in MAFTech. MAFQual includes the former Animal Health, Dairy, Meat and Agricultural Quarantine Divisions of MAF, plus the regulatory personnel from the Advisory Services Division.

Government requirements and especially reductions in appropriations meant that MAF had to become commercially orientated. For the financial year ending 31 March 1988 MAFQual has received an appropriation from government of $57.496 million. Our expenses are estimated at $114.125 million and our income at $49.670 million. This still leaves a deficit of $6.959 million. Forecast reductions in what government will contribute to MAFQual in each of the next three years to 1991 are down by another $2.427 million in 88/89; down another $6.818 million in 89/90 and down a further $5.64 million in 90/91. This is a cumulative reduction of $14.885 million by 1991 and will have to be met by increased earnings and a reduction in expenditure.

As about 80% of MAFQual's budget goes into salaries, any savings that can be made in that direction are keenly looked at. More than ever staff are being expected to generate income equal to or exceeding their salaries.

The effect on the apicultural advisory section is dramatic as with such a small client base our opportunities to generate high levels of income are much reduced. As a result of this it was with some difficulty that approval was given to replace Cliff van Eaton, AAO, Whangarei following his resignation. Trevor Bryant, AAO, Tauranga also resigned and Andrew Matheson, AAO, Nelson is being transferred to Tauranga to fill the vacancy. Negotiations are continuing over appointing an officer to Nelson. Mark Schrader, AAO, Oamaru, is taking extended leave without pay and the Oamaru position has had to be relinquished. It is hoped to combine the Oamaru and Gore apiary districts into one and service them from Invermay. The three officers leaving MAF will be sorely missed as they represented over 25 years of collective experience. Their contribution to MAF and the beekeeping industry is gratefully acknowledged.

Mark Goodwin began duties as an apicultural scientist in MAFTech at Ruakura. His position is jointly funded by the beekeeping and kiwifruit industries and MAF. The apicultural technician position, currently held by Anton ten Houten, was relocated from Wallaceville to Ruakura.

Over 33 field officers and livestock officers and 69 beekeepers were engaged as part-time inspectors last year. Again, a large number of beekeepers (45) did not seek payment for this work and this support is gratefully acknowledged.

Mr Brian Milnes, Field Officer, Auckland, began offering a bee disease diagnostic service from Lynfield, later extended to queen bee quality testing. These services are on a cost-recovery basis but beekeepers are encouraged to make better use of the service or it may have to be withdrawn.

BEEKEEPING STATISTICS

(a) Beekeepers, Apiaries and Hives

There were 7452 beekeepers owning 340, 433 hives of bees at 31 May 1987 (Fig. 1). Some of the increase in the number of registered beekeepers can be attributed to the "Bee Legal, Bee Registered" campaign initiated by AAO, Oamaru, and run nationwide by MAF in 1986. Over 30 articles were published plus several television and radio programmes and posters and stickers were given to beekeepers to distribute. Increased registrations ranged from 2% — 40% over the previous year in different apiary districts.

Hive numbers continued to increase dramatically as a response to increased demand for kiwifruit pollination, e.g. Whangarei 7% and Tauranga 13%.

(b) Honey Production

The total honey crop was assessed at 10091 tonnes (29.7 kg/hive) compared to last years crop of 9471 tonnes.

Every apiary district produced a honey crop this year although within districts there were wide variations in production. The honeydew crop was one of the smallest on record with many hives producing about 10 kg/hive.

Early sales were made at $1.75 — $2.00/kg with white honeys fetching their usual premium. However, a depressed export market saw a marked lack of buyer activity later in the season and much honey remains in beekeeper or exporter hands.

Sales of comb honey were bouyant with prices ranging from $34 — $40/doz. Some specialist honeys, such as manuka and ling leather, commanded very good prices.

(c) American Brood Disease

A small increase in infected hives was found by MAF or reported by beekeepers. Some areas continued to experience localised outbreaks especially Auckland where the spread can in part be blamed on the failure of several large beekeeping operations to observe their responsibilities under the Act. These outfits have often refused to register

Fig. 1: Beekeeper, apiary, and hive statistics for New Zealand as at 31 May 1987

	Beekeepers		Apiaries		Hives	
	1987	1986	1987	1986	1987	1986
Whangarei	690	659	1927	1849	19656	17867
Auckland	1492	1197	2848	2953	23509	27450
Hamilton	753	726	3041	3100	45705	46288
Tauranga	790	833	3788	3661	58423	52324
Palmerston North	1537	1393	4082	3851	40969	39434
Nelson	592	596	2260	2268	26341	25907
Christchurch	835	804	3782	3816	47869	48751
Oamaru	390	360	3661	3189	47710	41730
Gore	373	366	2231	2179	30251	29210
NZ Total	7452	6934	27620	26866	340433	328961

apiaries or obtain permits for sale of equipment and hives.

The Hawkes' Bay branch of the NBA initiated a hive inspection day that was organised and controlled by Ted Roberts, AAO, Palmerston North. Twentyone beekeepers (commercial and hobbyist) inspected 320 hives in 72 apiaries belonging to 65 different beekeepers; 10 hives were found infected with American Brood Disease in four apiaries. This initiative is to be commended and it is hoped other branches in similar situations will endeavour to have an inspection day as well.

(d) Queen and Package Bee Production

The estimated production of queen bees for sale on the domestic market was 73,900. A further 30,941 queen bees were exported to nine different countries while over 10,134 one kg-equivalent packages (each with one queen bee) were also exported.

Fig. 2: Honey production in tonnes by apiary district as at 31 May 1987

Year	Whangarei	Auckland	Hamilton	Tauranga	Palmerston North
1985	572	930	1697	1550	1088
1986	402	1096	1492	1150	887
1987	417	705	1506	1450	1012

Year	Nelson	*Christchurch	Oamaru	Gore	Total	Kg/hive
1985	685	1650	1352	790	10314	33.3
1986	871	950	1473	1150	9471	29.0
1987	966	1070	1954	1011	10091	29.7

*Christchurch figure includes honeydew

The estimated value of export queen bees and packages was NZ$569,500 C & F.

MAF EXPENDITURE

(a) Regulatory

MAF spent $100,073 on apiary inspection, export certification, and quality assurance to 31 May 1987. This included salaries and expenses for MAF staff when involved with these activities, and also wages and expenses for beekeepers acting as part time inspectors.

This compares with $133,414 spent in 1985/86. The decrease can be attributed to budget and employment restrictions imposed by MAF management in some regions. These costs are least costs and do not include any provision for overheads, replacement of

Fig. 3: American Brood Disease levels in apiary districts to 31 May 1987 (1985/86 figures in brackets)

Apiary District	Diseased Apiaries		Diseased Colonies		Apiaries inspected by MAF or MAF agents
	No.	%	No.	%	%
Whangarei	40 (65)	2.1 (3.5)	94 (141)	0.48 (0.8)	6.3 (10.6)
Auckland	240 (177)	8.4 (5.0)	867 (740)	3.7 (2.7)	4.0 (17.0)
Hamilton	87 (127)	2.9 (4.1)	175 (218)	0.4 (0.5)	8.9 (12.7)
Tauranga	267 (163)	7.1 (4.5)	595 (454)	1.0 (0.9)	6.7 (7.0)
Palmerston North	143 (112)	3.5 (2.2)	340 (344)	0.8 (0.9)	7.9 (11.0)
Nelson	130 (153)	5.8 (6.2)	266 (278)	1.0 (1.1)	7.6 (6.1)
Christchurch	81 (56)	2.2 (1.5)	432 (145)	0.9 (0.3)	14.7 (11.0)
Oamaru	103 (107)	2.8 (3.4)	193 (284)	0.4 (0.7)	9.7 (10.0)
Gore	107 (102)	4.8 (4.7)	447 (307)	1.5 (1.1)	11.5 (9.3)
Total	1198 (1050)	4.4 (3.9)	3409 (2920)	1.1 (0.9)	8.6 (10.5)

Fig. 4: Number of apiaries and hives with American Brood Disease found by MAF or reported by beekeepers to 31 May 1987. (1985/86 figures in brackets)

	No. Apiaries	No. Hives
Found by MAF or MAF agents	252 (276)	709 (1204)
Reported by beekeepers	946 (774)	2700 (1716)
Total	1198 (1050)	3409 (2920)

Fig. 5: MAF expenditure on apiary inspection export certification and quality assurance for the year ending 31 May 1987. (1985/86 figures in brackets)

	No. Used	KM	KM Cost (40c/km)	Days 8 hr	Wages $
MAF Staff	44	36607	14642	550 (900)	69119
Beekeepers (paid)	24	8932	5407	129 (136)	10905
Beekeepers (unpaid)	45				
Total	113 (141)	45539 (53214)	20049 (21304)	679 (1036)	80024 (112110)

vehicles, computers etc., or operation of the apiary register.

Cost recovery for certification work has been in place for some time and the application to the Minister for a regulation to permit an annual registration fee to be charged to all beekeepers is still being actioned. The Minister has given aproval for the regulations to be drafted. The fee applied for was $15 per beekeeper including GST.

It is anticipated that such a registration fee will cause massive evasion by hobbyist beekeepers and will make the maintenance of an accurate register even more difficult than it is at present.

(b) Apicultural Advisory and Inspection Service

The following budget has been prepared for the year ending 31 May 1988. The apicultural section is in a deficit situation and is likely to remain so at present staffing levels.

	Year Ending May 1988	Year Ending May 1989
Consulting (mainly auditing kiwifruit pollination hives)	31,000	40,000
Import/Export certification	700	1,200
Hive registration fee (if passed by parliament)	90,000	90,000
Foreign Affairs contracts	3,000	
Disease control contract NBA (15c hive)		43,500
Less salaries and expenses (no provision for overheads)	328,897	330,094
(deficit) surplus	(204,197)	(155,394)
plus salary saving	10,273	23,944
(deficit) surplus	(193,924)	(131,450)

The options for MAFQual managers are as follows; bearing in mind the expected MAFQual busines unit deficit of $6.959 million for 1987/99:

★ Accept the deficit and make savings elsewhere within MAFQual.

★ Reduce services unless full cost recovery can be obtained. This may mean further reductions in AAO positions.

★ Generate more Income.

ADVISORY ACTIVITIES

(a) Kiwifruit Pollination Hives

MAF audited a large number of hives either for individual beekeepers or growers or various pollination associations. Lack of grower-beekeeper contracts and acceptance of agreed hive standards caused some problems. MAF, orchardists and beekeepers have been working to redress these concerns with good effect. Most of the pollination was done by members of the various pollination associations. Grower awareness of the importance of quality hives increased and price was not so important. Pollination advice is available to growers through Pollenplan, a consultancy service supplied by MAF.

Over 80,000 hives were placed in kiwifruit orchards in 1986 for an average fee of $75.00. Some 233 beekeepers were involved and the pollination fees represented a gross return in excess of $6 million to beekeepers. Thirty three beekeepers placed 9147 hives in other crops requiring pollination.

Following a difficult season in 1985/86 many growers increased their orders for bee hives, frequently exceeding the MAF recommendation of 8/ha for orchards with competing floral sources nearby.

Failure to secure loads by beekeepers continued to cause concern as did the indiscriminate placing of some apiaries.

(b) Beekeeping Organisations

MAF liaised closely with a number of groups but especially the pollination associations and the queen bee producers' association. A tape slide display and pro-

NEW ZEALAND BEEKEEPER, APIARY & HIVE STATISTICS AS AT MAY 31 1987

	1-5 hives			6-50 hives			51-250 hives		
	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives
Whangarei	457	512	986	185	432	2692	30	294	3398
Auckland	1119	1233	2296	326	762	5151	33	276	3829
Hamilton	454	537	1026	233	511	3447	34	329	4953
Tauranga	429	509	1028	259	541	4690	49	414	6870
Palmerston Nth	1112	1115	1833	355	819	5341	41	464	4948
Nelson	366	438	822	158	436	2562	39	367	4523
Christchurch	570	687	1148	172	497	2730	52	455	6944
Oamaru	208	240	483	108	282	1959	37	489	5074
Gore	196	229	451	116	223	1398	27	228	2368
NEW ZEALAND	4911	5500	10073	1912	4503	29970	342	3316	42907

	251-500 hives			501-1000 hives			More than 1000 hives		
	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives
Whangarei	7	182	2784	7	277	4726	4	230	5070
Auckland	10	250	3839	0	0	0	4	327	8394
Hamilton	10	295	4635	10	348	8500	12	1021	23126
Tauranga	26	444	9725	15	504	12396	12	1376	23714
Palmerston Nth	11	289	3365	9	407	6916	9	988	18566
Nelson	17	390	6155	9	364	7341	3	265	4956
Christchurch	16	298	7247	16	699	12280	9	1146	17520
Oamaru	8	300	4178	15	844	11057	14	1506	24959
Gore	9	211	3242	18	766	12679	7	574	10113
NEW ZEALAND	114	2659	45170	99	4209	75895	74	7433	136418

	1-50 hives			More than 50 hives			Totals		
	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives	Beekeepers	Apiaries	Hives
Whangarei	642	944	3678	48	983	15978	690	1927	19656
Auckland	1445	1995	7447	47	853	16062	1492	2848	23509
Hamilton	687	1048	4473	66	1993	41232	753	3041	45705
Tauranga	688	1050	5718	102	2738	52705	790	3788	58423
Palmerston Nth	1467	1934	7174	70	2148	33795	1537	4082	40969
Nelson	524	874	3384	68	1386	22957	592	2260	26341
Christchurch	742	1184	3878	93	2598	43991	835	3782	47869
Oamaru	316	522	2442	74	3139	45268	390	3661	47710
Gore	312	452	1849	61	1779	28402	373	2231	30251
NEW ZEALAND	6823	10003	40043	629	17617	300390	7452	27620	340433

NEW ZEALAND HONEY PRODUCTION, IN TONNES
(As at 31 May Annually)

	Whangarei Auckland Hauraki Plains	Waikato King Country Taupo	Bay of Plenty Coromandel Poverty Bay	Hawkes Bay Taranaki Manawatu Wairarapa	NORTH ISLAND	Marlborough Nelson Westland	North & Central Canterbury	South Canterbury N & Central Otago	South Otago & Southland	SOUTH ISLAND	New Zealand	Yield per Hive (kgs)
1971	440	1239	671	581	2931	207	711	895	914	2127	5658	28.2
1972	489	1247	518	1079	3333	252	406	1082	620	2360	5693	27.9
1973	573	1069	600	551	2793	424	600	610	914	2548	5341	25.7
1974	386	1094	680	702	2862	255	600	490	1055	2400	5262	25.5
1975	448	1378	750	890	3466	330	1200	1300	1115	3945	7411	36.3
1976	375	530	280	554	1739	256	1200	950	770	3176	4915	23.9
1977	482	1433	490	704	3109	483	1000	821	665	2969	6078	29.3
1978	450	1646	1000	1440	4536	394	950	959	1440	3743	8279	39.2
1979	420	1360	640	835	3255	265	1050	1249	655	3219	6474	28.5
1980	550	1129	400	810	2889	590	1750	1225	1035	4600	7489	32.0
10 yr Ave	461	1213	603	815	3091	346	947	958	918	3169	6260	29.7
	Whangarei / Auck.											
1981	650	1043	470	1088	3251	491	1150	1100	940	3680	6931	29.1
1982	600	1465	1130	1020	4215	325	430	550	975	2280	6495	25.6
1983	696	877	720	360	2653	300	1050	900	150	2406	5053	18.8
1984	300	731	682	495	2208	800	1150	1100	560	3610	5818	21.0
1985	572 / 930	1697	1550	1088	5837	685	1650	1352	790	4477	10314	33.3
1986	402 / 1096	1492	1150	887	5027	871	950	1473	1150	4444	9471	29.0
1987	417 / 705	1506	1450	1012	5090	966	1070	1954	1011	5001	10091	29.7

Report by Dr Denis Anderson, Honey Bee Pathologist

INTRODUCTION

During the 1986 National Beekeepers' Annual Conference at Rotorua I outlined my major research projects as well as those which would commence in the near future. Also outlined were some preliminary results from the previous years' work and their implications for the New Zealand Honey Bee Industry. Most of the work described at that Conference was done with no technical assistance. However, during the work that I will be describing to this year's Conference I am pleased to acknowledge the assistance of Mrs Helen Murray. I sincerely thank the industry for sponsoring the costs of employing Helen who has shown herself to be a competent and conscientious worker as well as a keen learner. Her newly-acquired skills and expertise will be a valuable resource to the industry in years to come.

In this brief report I will describe aspects of my work over the past year and outline future research directions. The projects that will be described and the approximate percentages of work time allocated to each are as follows:

- Studies of bee viruses, particularly Kashmir bee virus (10%)
- Nationwide survey of honey bee diseases (30%)
- 'Half-moon' disorder (50%)
- Other projects (10%).

STUDIES OF BEE VIRUSES

Studies of the ecology, worldwide distribution, and the molecular biology of Kashmir bee virus (KBV) have continued. It is essential that this research continue, as the Ministry of Agriculture, Food and Fisheries (MAFF) in the United Kingdom is presently collating recent information about KBV before reassessing their current policy on live bee imports.

During the past year I detected KBV in honey bees in Fiji. Thus I have now found the virus in honey bees from Australia, New Zealand, Canada, and Fiji. Molecular studies on the coat proteins of the virus isolates indicate that the Australian, New Zealand, and Fiji isolates are closely related even though they are serologically distinguishable. However, the size and serology of the coat proteins of the Canadian isolate are much different from the other isolates.

KBV has also been found to cause natural inapparent infections in three other insect species in New Zealand. This is an interesting discovery as all the other known bee viruses, except acute bee paralysis virus, have been shown to be host specific. Further studies in this area may shed more light on the origin of KBV.

NATIONWIDE SURVEY OF HONEY BEE DISEASES

The objectives of a nationwide survey of bee diseases were to determine and monitor the occurrence and distribution of the known honey bee pathogens in New Zealand and to identify those areas requiring future research. The survey is one of the most comprehensive of its type ever undertaken. It involves co-operation from the nine Ministry of Agriculture and Fisheries (MAF) apicultural advisory officers, and 75 commercial beekeepers, distributed evenly throughout New Zealand and representing 10% of all New Zealand commercial beekeepers.

The survey, for those who may be unfamiliar with it, commenced in the spring of 1985 as an ongoing quarterly survey. However, after the spring 1986 survey it became an annual spring survey. The surveying procedure involves each of the 75 participating beekeepers collecting samples of brood, and live and dead adult worker bees from one of their colonies. These samples are sent to me for testing for protozoan, bacterial, fungal, mite, and viral infections.

Returns from all the surveys, except one, have been analysed and the results placed on computer files. These, as well as the results of the unprocessed survey returns (i.e. spring 1986), together with those of the forth-coming spring survey returns, will be made available to all members of the beekeeping industry at the end of this current year in the form of an illustrated, comprehensive report. Only small sections of this report, mainly the methods sections, will be written in a technical style. All other sections will be written in a non-technical descriptive manner so that it may be read and understood by most beekeepers. The report will list the results, and describe their implications to the industry. It will also assess where future research would be best directed. Such information cannot be given in short, concise, scientific papers. Nevertheless, information will be extracted from the report for later publication in scientific journals.

To date, the results from the survey have proven rather interesting. For example, nosema disease, caused by the protozoan *Nosema apis* has been found to be the commonest, widespread, and most serious disease of adult worker bees in New Zealand. Its level in many spring and summer colonies is unacceptably high and must be affecting honey yields in certain areas. Chronic paralysis, caused by chronic bee paralysis virus, is another common disease of adult worker bees. Overseas studies have shown that the presence of overt symptoms of chronic paralysis are dependent on several genetic resistance factors being present in bees. This suggests that New Zealand bees generally may be lacking some of these resistance factors. The presence of amoeba disease of adult worker bees caused by the protozoan *Malpighamoeba mellificae* has also been confirmed.

American foulbrood, caused by the bacterium *Bacillus larvae* is potentially the most serious brood disease in New Zealand. However, chalkbrood, caused by the fungus *Ascophaera apis*, is the most common serious disease of brood and the results from consecutive surveys since 1985 have shown that the distribution of the disease in New Zealand has increased during the previous two years. For example, results of early surveys showed that the disease was restricted to the north of the North Island, but later surveys showed that areas in the south of the North Island were infected and the latest surveys

MAF Report Concluded

motional leaflets were designed and sent to Canada for showing at three beekeeper conventions in an attempt to increase New Zealand queen and package bee sales.

(c) Foreign Affairs

One off-shore project was completed for Foreign Affairs in Fiji as well as several on-shore training programmes for beekeepers from Tuvalu and Thailand.

(d) Apiary Databank

This computerised system, which forms the basis for the apiary registers, was developed by John Smith, AAO, Christchurch, and Bob Halliday, Systems Analyst, Christchurch. Major development work on the programme was completed before charging for such services was implemented.