

THE NEW ZEALAND KIWIFRUIT AND AVOCADO INDUSTRIES 1982

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The New Zealand kiwifruit industry is now an industry of national importance.

It is an industry of rapid growth and wide geographical spread. See Tables 1 - 5.

With the rapid increase of plantings production will rise dramatically in the next few years. See Tables 6 and 7.

It is a very highly export oriented industry. See Tables 6, 7 and 8.

It is a high value industry that will be of great significance to the New Zealand economy. See Table 9.

With the rapid increase in the industry the demand for bee-hives for pollination will increase dramatically. See Table 10.

At the currently recommended hiving rate of 8 per hectare, the 21,000 hectares of bearing vines in 1992 would require 168,000 hives. If by increased understanding, knowledge or technology, this could be reduced to 2 per hectare the hives required would be 41,000.

As kiwifruit are more vulnerable to a run off in pollination than most other crops, the emphasis on pollination is going to be of even greater significance to the New Zealand economy in 1992 than it is now. See Table 11.

At present New Zealand has approximately 50% of the world kiwifruit plantings, and our spread of markets in a wide range of countries reduces our dependence on any one market and its economic, social or political stability.

See Tables 12 and 13.

Of the other subtropical crops grown in New Zealand that require bees for pollination, the avocado looks the most exciting.

The New Zealand avocado industry is small, but in a phase of rapid growth. See Table 14.

The Bay of Plenty is the only major avocado area, but there is also some significant production from Poverty Bay and new plantings in Auckland and Franklin. See Table 15.

The avocado is a high value product with export potential. High returns have been received from small consignments so far sent to Australia. See Table 16.

Pollination is also important in avocado production and the approximately 400 hectares now planted could soon require over 1000 hives for pollinating purposes in the months of October and November.

With the rapid growth of industries such as kiwifruit and avocados, the value of pollination of these crops to the national economy becomes of great importance. All the necessary emphasis of this importance must be made so that policies can be formulated to allow for the optimum benefit to be achieved for the nation, the grower and the beekeeper.

NEW ZEALAND KIWIFRUIT PLANTINGS

<u>Y E A R</u>	<u>H E C T A R E S</u>
1968	190
69	295
70	440
71	600
72	720
73	740
74	825
75	1030
76	1220
77	1520
78	2100
79	3500
80	5300
81	7600

1972 - 1981 OVER 1000% INCREASE

TABLE 1

POLLINATION - CAN THE BEEKEEPING INDUSTRY COPE?

T G Bryant, Apicultural Advisory Officer
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Throughout the preceding year there have been a great many reports, articles, and scientific papers published spreading doubt/doom about the ability of the beekeeping industry to meet the demands of kiwifruit pollination.

Headlines in various journals, I quote: "80 000 hives not needed", "Bumble bees more efficient" and statements such as "beekeepers are alternative lifestylers" are all too common. One reporter went so far as to suggest that no pollinating agents are required, wind is the answer. But he forgot to check actual production figures, never considered effects on fruit quality and failed entirely to consider the important fact that to produce fruit of export standard requires either insect visitation or a combination of wind/insect pollination. The honey bee is an easy scapegoat for explaining away any crop failures. All this and more is effectively casting doubt not only on the professionalism of existing beekeepers, but also clouding the real issues. A key word in all the arguments put forward is export or more correctly, loss of valuable export dollars. This has resulted in publishing of a report on pollination by DFC which further clouds the issue.

It is the goal of scientists researching artificial pollination to eliminate entirely the need for bees in kiwifruit orchards. They estimate that just 97 ha of males would produce enough pollen for the entire industry.

But just for one moment imagine the following scenarios. All male vines are removed from orchards and therefore need for bees entirely eliminated but just say two all male orchards are hit by the fungal and bacterial diseases sclerotinia, Botrytis, bud rot - or heavy frosts at flowering,

storm damage, drought etc. With just 20% damage the effect is horrifying to contemplate. Those supplying pollen would be in a position to hold the entire industry to ransom. This and other factors and remember the concept of artificial pollination is only 80% perfected, lead me to believe that artificial and honey bee pollination both have a place. One will complement the other.

I would also suggest that if just 20% of research monies spent on such slights of fancy as the work on other insects; ie Bombus, native bees and this year, leaf cutter bees, were channelled into research on honey bees then a great deal more progress with accruing benefits would have been forthcoming. I'm particularly pleased to see that at long last the sole researcher on honey bee pollination, Pat Clinch, is being given more resources to work with. This year a research programme on honey bee pollination is being undertaken with Professor Cameron Jay, into the foraging activities of honey bees in kiwifruit orchards.

It is our firm belief that this work will go a long way to negate much of the adverse comments/criticism made by uninformed people about the beekeeping industry.

Let's forget about artificial pollination and consider the case. Can the industry meet the requirements of a rapidly developing kiwifruit industry?

Beekeeping Statistics/Pollination Requirements (see overheads).

All this indicates to me that the beekeeping industry can cope and is in fact expanding to meet the challenge. There are a number of important issues which must be faced if these projected increases occur and I see no reason

why they cannot be met.

D F C REPORT

FIG III

POTENTIAL HIVES (MAF) FIG IV

The pressure for apiary sites in the more traditional beekeeping areas will be immense. Beekeepers will be faced in many instances with finding alternatives to honey production as crops that once provided a surplus of honey, because of over-stocking only provide for the colonies needs. For many, pollination will be the main source of income, supplemented with sales of bees (packages) and queens for export with some income derived from other hive products such as propolis, beeswax and possibly pollen. Pollination of other crops such as avocados, asian pears, squash will help boost incomes.

Mechanisation of the industry and its ability to move beehives long distances quickly and efficiently is of paramount importance. Gone are the days of the armstrong lifter, telescopic lids and the like. Orchardists will also have to come to grips with this fact.

These problems and a host of others require urgent debate now, not when the problem arises. No longer can beekeepers isolate themselves. A great deal of co-operation and understanding will be necessary from all sectors of the industry/beekeeper/horticulturist/agronomist. The need for development of a larger queen bee industry to match the growth in hive numbers is critical. Should a package bee industry evolve, queen breeders must be included in any development programmes. These are just a few of the many important considerations to be faced. Others are use of pesticides, modified environments, finance, bee breeding, transportation, labour, education, communication/dialogue with orchardists, utilisation of toxic honey zones to mention but a few more. A multi disciplinary approach is essential if the real or imagined

potential of horticulture per se is to be realised with accruing benefits for individuals and the nation.

The process is in place to meet these challenges and none are insurmountable. We should not however overlook the realities of the situation. MAF recommends that 8 hives/ha are needed to guarantee a good crop. In reality most growers place only 4-6 hives/ha. It is interesting to note that some growers use even less, often as a result of beekeepers questioning the need for more. In some situations this lesser number may be sufficient but the preliminary results of a survey indicate that those growers who have 8 or more hives/ha regularly average more production than those using less hives. In many instances for an additional outlay of just \$192 for four more hives/ha, an average production in excess of 6000 trays/ha is achieved. District average is 5000 trays/ha. One grower relying on wind and bees at 1/ha averages less than 4500 trays/ha. He may be able to afford it but the loss of potential production is enormous when you consider top growers are producing in excess of 6500 trays and these growers rarely use less than 8 hives/ha; in some cases 10 hives/ha are used.

Bees are treated by these growers as an investment. Where else could you invest \$384 for a return grossing in excess of \$52,000/ha, providing that all the ingredients are put into place?

Many are questioning the need for 8 hives/ha and hopefully the research project being initiated this year under the capable guidance of Dr Jay and Pat Clinch will go a long way to answer many of the questions relating to this very important point. Orchard layout is a point in question. No one when designing orchards, plant layout and male/female ratios, thought of the foraging honey bee and pollination. Clinch's work suggests that it is like

a game of chance, you may or may not win. Consultation with apiculturists at the outset may have avoided these mistakes.

One very important factor rarely considered by those outside the industry is the law of supply and demand. Should there be a shortfall in the number of hives it will be the growers who determine the pollination fee. This will inevitably be higher than that demanded by industry and will give additional incentive for beekeepers either not involved to become involved and give beekeepers the incentive to expand their existing operations more rapidly.

This raises the question of finance or lack of finance. Who should own the hives? Unquestionably growers have the right to own beehives. As to managing these hives, if they are to be used effectively as pollinating units growers should leave that to those with the necessary skills.

The history of the grower/farmer owned/operated hives throughout New Zealand is not encouraging and it doesn't need much imagination to predict the potential hazards to the careful beekeeper where honey bee colonies are neglected. The serious bee disease AFB may be a minor problem but it has the very real potential of quickly becoming a major one. Today in the Bay of Plenty as elsewhere, orchardists are recognising the fact that they cannot manage bees as well as an orchard. Many of those original orchardist/beekeepers are now selling their hives.

Those who are concerned about their future pollination requirements are financing existing/new beekeepers on a money for pollination basis - a much more sensible arrangement for all concerned.

They have acknowledged the fact that bees maintained in orchards all year round are not good pollinators of kiwifruit and the extra care essential when spraying programmes are undertaken is putting many orchardists under pressure.

In concluding this paper, I would summarise briefly, loudly and clearly, the beekeeping industry can cope and meet the demands of a dynamic industry, kiwifruit; a great deal has been achieved over the past decade, most of which is unrecorded. There is a great deal of work yet to be done. There are a host of challenges to be conquered. The beekeeping industry, in my view, has the skill, courage and ability to meet and overcome all of them, but we must be more positive in projecting ourselves. The negative aspect of many reports can be directly attributed to lack of positive direction and scepticism imparted to the authors by beekeepers. I'm confident, buoyant and the eternal optimist. I believe most beekeepers are. We have a very exciting decade ahead of us. With co-operation, liaison, dialogue between all interested and participating parties there is a good deal to look forward to.

Fig 1

APIARY STATISTICS as at 31.5.82

	<u>Total # Beekprs</u>	<u>Hives</u>
Auckland (includes Nth AKld)	1957	27426
Hamilton	620	40852
Tauranga	577	30316
Palmerston Nth	1143	36770

<u>Increase 81.82</u>	<u>Beekkeepers</u>	<u>Hives</u>
AUCKLAND	6%	10%
Hamilton	3%	2%
Tauranga	8%	14%
Palmerston Nth	6%	5%
	<hr/>	<hr/>
AV. GROWTH	5.8%	8%

Fig 11

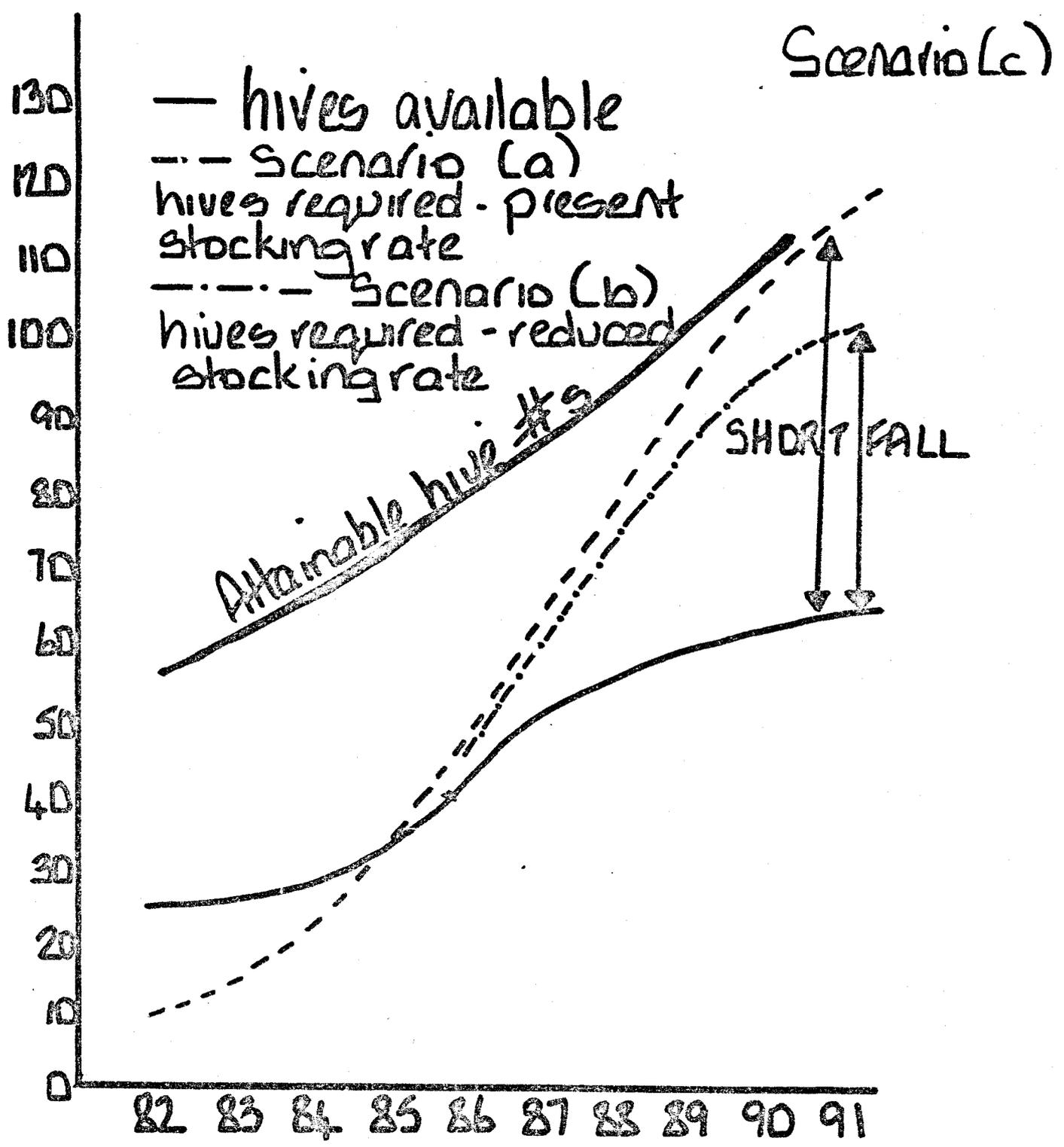
APIARY STATISTICS as at 31.5.82

More than 50 hives

	<u>Beekeepers</u>	<u>Hives</u>
Auckland	71	19483
Hamilton	57	37474
Tauranga	60	27530
Palmerston North	<u>60</u>	<u>30489</u>
	248	114977

<u>Increase 81-82</u>	<u>Beekeepers</u>	<u>Hives</u>
Auckland	6%	13%
Hamilton	- 5%	2%
Tauranga	20%	17%
Palmerston North	5%	5%
Av Growth	6.5% (5.8%)	9% (8%)

SHORTFALL OF BEEHIVES REQUIRED FOR POLLINATION - NORTH ISLAND



Adapted as per DFC Report

FIG III

Fig IV

Beekeeping attainable hive numbers
(Based on present growth trends)

Av growth	9%	North Island
	1982	114977
	1985	148899
	1990	229100

Assume 50% available pollination
114550

Shortfall 1990 now becomes
excess 10,000 colonies at
8 hives ha.