AGRICULTURE IN **TARANAKI** SINCE 1963

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Abstract

Despite the impression that Taranaki is predominantly a dairy farming area, only 37% of the total pasture and crop lands, and 59% of the total stock units are in dairying. In the last 10 years dairy production has increased signficantly, but with many farmers now approaching 100% pasture utilisation future increases must come from increased pasture growth which has been static for the past 15 years.

Sheep and beef production is centred mainly in the hard eastern hill country. Though it offers the greatest potential for increased agricultural production in Taranaki, the area is not productive enough at current farm product and phosphate prices to prevent reversion to scrub. Currently the land is in the development phase, but with adequate topdressing and controlled grazing, the long term economic viability of the hill country should improve.

Horticulture is expanding rapidly along the suitable western coastal strip of Taranaki, and co-operation with the highly efficient dairy industry would seem logical.

While future propcrity appears to lie with the petro-chemical industry, these are finite, whereas the soils and climate are permanent ensuring the long term future of agriculture in Taranaki.

INTRODUCTION

Gained from Tourist Publicity, the common impression of Taranaki Agriculture would be Mt Egmont and dairy cows. The mountain certainly is a major influence on the province's agriculture through its contribution to soils, topography, and climate. However, the view that the provinces agriculture is overwhelmingly dairy farming is totally inaccurate. This would only be true if Taranaki was considered to be confined solely to the ring plain area around Mt Egmont but the 9 counties making up the Taranaki land area cover much more territory than that.

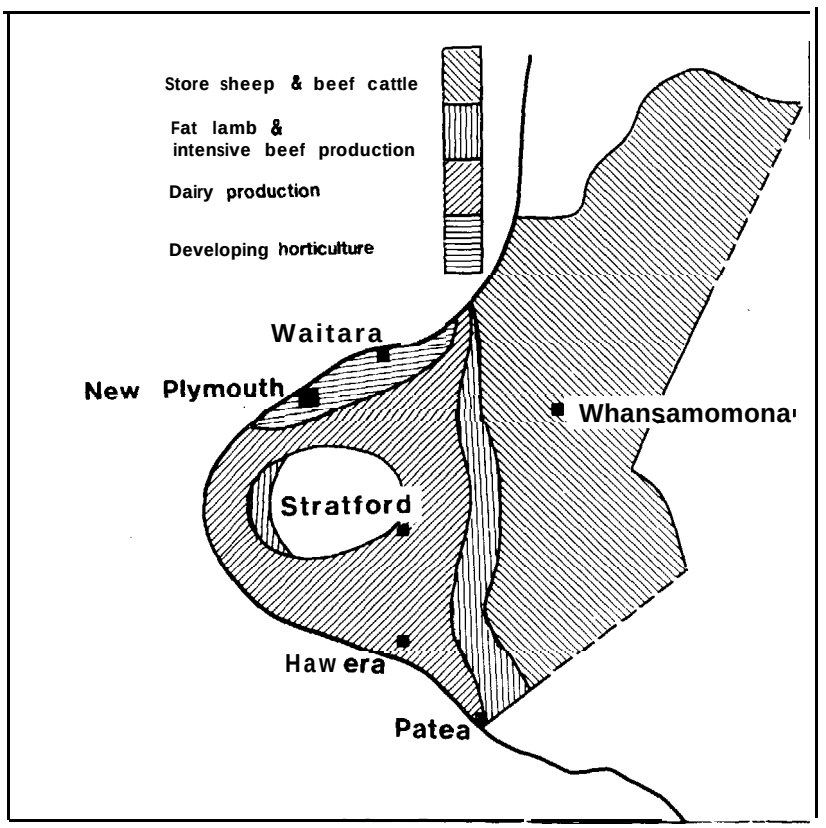
SOIL AND LAND USE PATTERN

Land use is dictated, primarily by topograhy and climate as there is little *major* variation in the soils throughout the region. This should be emphasised because a cursory inspection of the soil maps of the region present a multitude of soil types so that the overwhelming impressionis one of an extremely complex pattern of soils. In details this is true. To complicate an understanding of Taranaki soils look for differences — to simplify it look for similarities.

In very simplistic terms what all Taranaki soils have in common is the influence of Mt Egmont which has overlain all of Taranaki with volcanic ash

from two main formations, the Egmont and Stratford showers. The prevailing westerlies deposited the lighter ash on the uplifted marine beds of the Eastern Hill Country so that this area is still basically a mudstone/sandstone base with a top layer of ash which has been eroded to varying thicknesses with the passage of time. Closer to the mountain on the ring plain the ash lies much thicker while on the western side, soils were formed from the heavier material rolling down the mountain, and much less fine ash, giving rise to the characteristic stony laharic soils there.

All Taranaki soils have the common Mt Egmont ash and the distinguishing characteristics of this ash is the mineral andesite. This gives the soil its highly desirable work-ability and free draining characteristics. It also makes it prone to drought (generally not a problem with good summer rain) and grass grub populations. However the biggest and most undesirable features of the andesite is its high phosphate retention capacity so that *all* Taranaki soils require high P inputs for successful plant production.



IG. 1: ***Predominant Land use pattern in Taranaki.***

TABLE 1. TOTAL STOCK NUMBERS IN TARANAKI — JUNE 1980

STOCK CLASS	NUMBERS	LIVESTOCK UNITS
Dairy Cows & Heifers in Calf	383,131	
Dairy Cattle	495,743	
Dairy Cattle L.S.U.		3,358,012
Beef Cows & Heifers In Calf	51,812	
Beef Cattle	188,251	
Beef Cattle L.S.U.		884,141
Breeding Ewes	1,179,155	
Sheep	1,658,589	
Sheep L.S.U.		1,497,582
Total L.S.U.		5,739,735

Source — Department of Statistics

TABLE 2. TYPE OF FARMING — JUNE 1980

Total number holdings	4461
Total grassland	447,611 ha
Area under crop	3,287 ha
Herds of 10 or more dairy cows	2807
Number flocks shorn	1257
Cropping and horticultural units	90
Land occupiers in dairy	63%
Stock units in dairy	58.5%
Estimated farmed land in dairying	37%

Sources Department of Statistics
N.Z. Dairy Board
Ministry of Agriculture & Fisheries

As a consequence, while the agriculture of Taranaki may be diverse both in type and location (Tables 1 and 2), land use falls predominantly into the following broad categories (Fig. 1).

(1) Ring plain surrounding Mt Egmont — dairying.
(2) Eastern hill country — store sheep and beef cattle.
(3) A small strip of easier country — Inglewood to Patea and western side of Mt Egmont — sheep and beef fattening.
(4) Coastal strip from Okato to Urenui horticultural expansion and some cash cropping.
(5) South Taranaki Plains some cash cropping.

With this background then Taranaki agriculture can be viewed, in its broad components of dairy, sheep and beef and cropping horticulture, and as an entirety.

A commonly held opinion has been that after significant expansion in the 1960, the dairy industry in Taranaki during the 70s has been in a state of decline. Statistics like those in Fig. 2 have been quoted to support this argument and suggest a steady erosion of people from the industry as the total

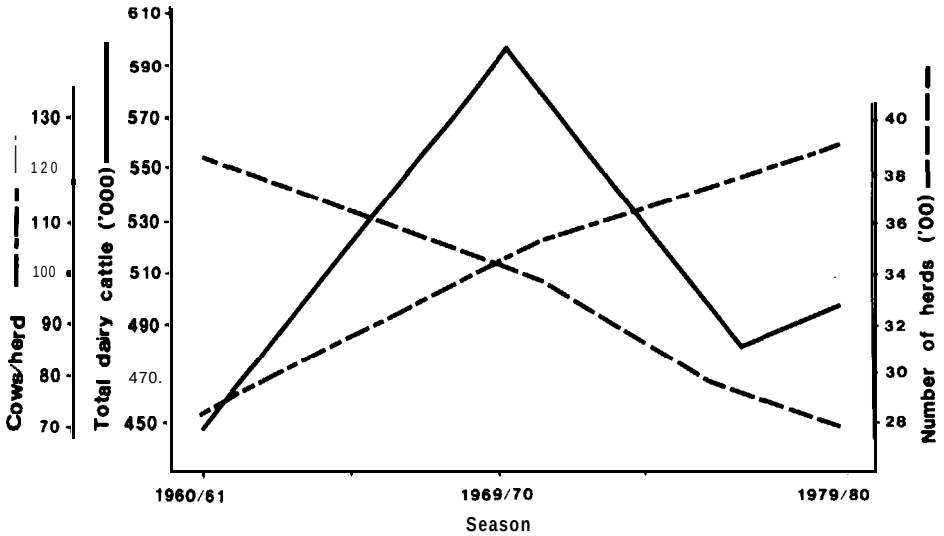


FIG. 2: *Trends in the dairy cow population since 1960.*

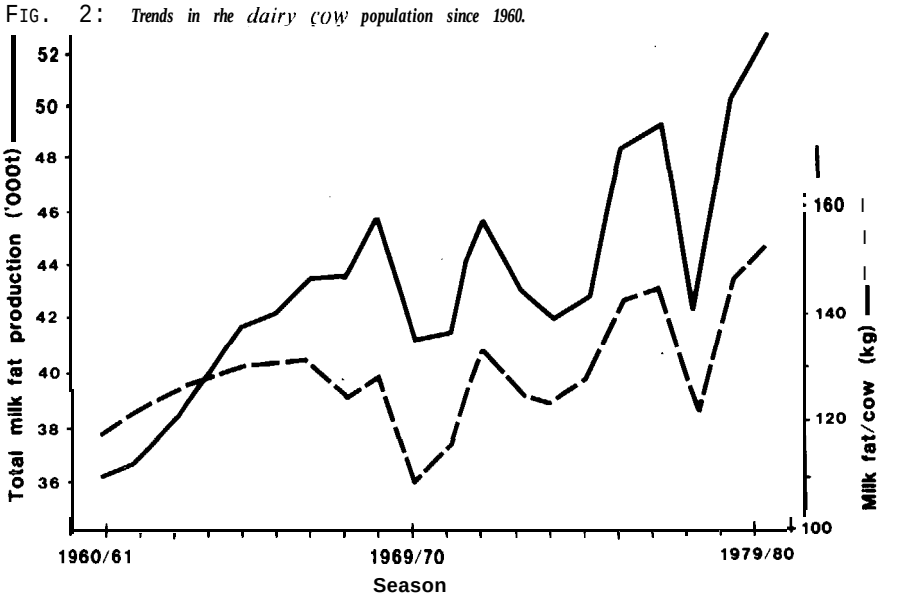


FIG. 3: *Trends in dairy production since 1960.*

number of herds reduced and the size of the herds increased. Changes in actual stock numbers support the commonly held belief of expansion through the sixties, followed by severe retrenchment with the onset of the adverse climatic and economic conditions of the late 60s and early 70s with a tentative gradual re-expansion in the late 70s as prices improved.

Advisory services suffered considerable criticism in relation to these trends. Firstly for promoting the higher fertiliser/ higher stocking rate concept resulting in over-stocking in the 1960s, and secondly, for providing an advisory service to dairy farmers in the 70's which was totally ineffective in that the dairy industry continued to decline.

That these are misconceptions can be easily seen by looking at the significant production data (Fig. 3). In the early 70's, while production did indeed stagnate at about the level of the mid 60's, there has been as spectacular increase in both total and per cow milkfat production since the mid 70's to levels well in excess of the 60's. More significantly this increase has been achieved from a diminished base of, stock numbers and herds, more cows per herd, (Fig. 2), and in the last 4 years considerably below normal late winter/early spring grass production. In relation to the criticism of advisory services, it is more than coincidental that in 1974, after reviewing the situation, Taranaki Farm Advisors implemented a campaign of better feed utilization and cow nutrition (particularly in late autumn and spring) to lift per cow and thus total, production.

The question now facing many Taranaki dairy farmers is where to go from here. Under a milking cow only dairy system it will require, 23.3 kg DM to produce lkg M.F. Taking the best recent annual DM production from Waimate West of 15000 kg DM/ ha, with 100% utilization of grass grown on an all cow system, this results in a maximum potential production of 644 kg MF/ ha. In Taranaki at present there are farmers producing at this level. For these people the only possible method to further increasing production is to improve dry matter production beyond the 15000 kg DM/ ha/year. In 1964/65, the best year of the sixties annual production at Waimate West was 15180 kg DM/ ha. In the best year of the 70s — 76/77 — it was 15,230. This indicates that while in the last 15-20 years considerable progress in increasing the efficiency of utilization of our grasslands has been made little or nothing has been achieved in producing more pasture DM/ ha. Now with efficiency of utilization approaching 100%, unless we can further extend the frontiers of pasture production it is inevitable, and indeed desirable, that some of our best grassland in Taranaki will be lost to a more lucrative and rapidly expanding horticultural industry.

In retrospect, there can be little doubt that in many cases the philosophy of high stock/ high fertiliser of the mid 60's was misapplied. However the very big positive effect of this was to convert much of the dairy pasture from a predominant browntop base to one of vigorous ryegrass and white clover. This is the big legacy we still enjoy today and the improved production of the late 1970s would not have been possible without it.

The common belief is that productivity from Taranaki Hill Country is poor in relation to the rest of the North Island. On a statistical basis this is true (Table 3) but such comparisons are to an extent misleading. Taranaki has only a very small area of intermediate country that can run intensive sheep and beef fattening units. More typically the transition from easy to hard hill country is rapid with very little intergrade of easy country to increase lambing percentages and wool weights. On this basis performances on straight hard hill country compare favourably with other regions. Since 1960 trends in stock numbers have mirrored the national trend with the ratio between sheep and beef numbers being largely a reflection of relative profitabilities (Fig. 4).

TABLE 3. SHEEP PRODUCTIVIY — 1979/1980

Lambing Percentage	Taranaki	***91.5***
	North Island	***92.8***
	New Zealand	***99.6***
Wool per Sheep Shorn	Taranaki	***4.57*** kg
	North Island	***4.72*** kg

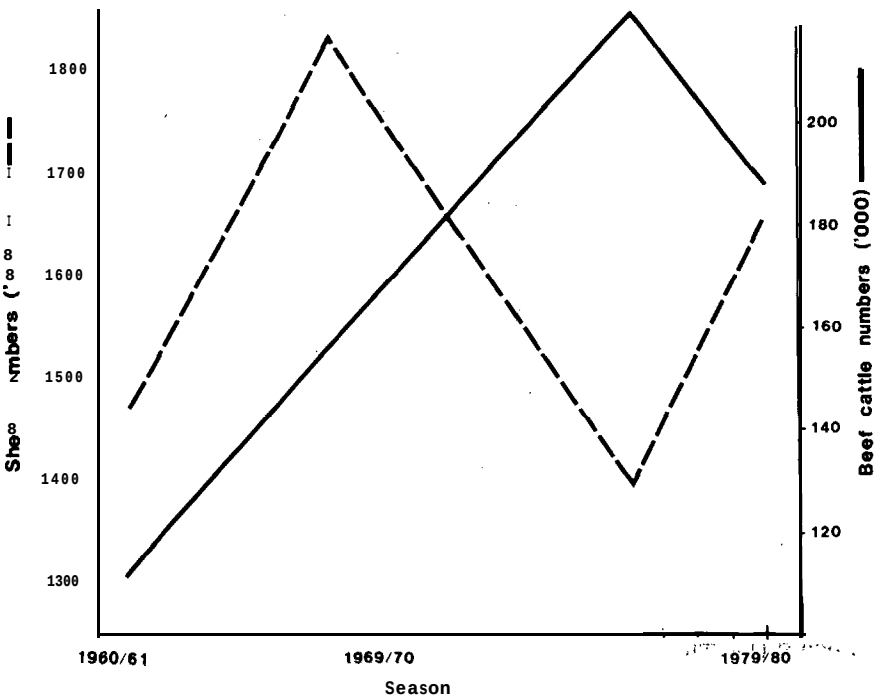


FIG. *4: Trends in sheep and beef populations since 1960.*

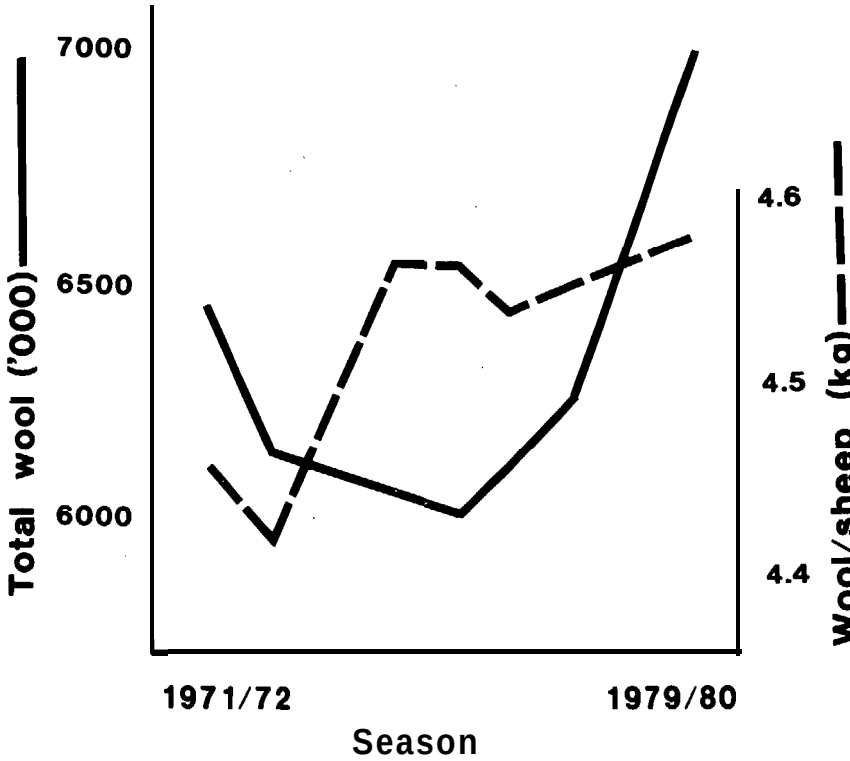


FIG. *5: Wool production in Taranaki since 1970.*

Sheep numbers are currently expanding again, with a concurrent improvement in per stock unit productivity (Fig. 5) for which extension activities must take some credit.

HILL COUNTRY DEVELOPMENT

Historically most of the Taranaki Hill Country was cleared from native bush about the turn of the century. The original bush burn gave an initial short term boost in soil fertility enabling grass and clover to be established. With the rapid depletion of that fertility, continual development and improvement became, and remains, a high cost operation in relation to returns per hectare. In the worst instances, low prices and falling productivity results in the abandonment of a large area of land in the Aotuhia regionjust prior to World War II.

As an aside, the 1978 Land Use Study of the area estimated there is 7000 ha of potential farm land in Aotuhia with a total potential carrying capacity of 91,000 S.U.s. The reason for the final abandonment of Aotuhia was the cost and standard of access and roading and this is still a major problem of the Taranaki Hill country today. Indicative of the priority this is given is the fact

that in 1974 MOWD assessed the cost of providing county standard road access to Aotuhia at $2 I 1,000. Inflation since then would now make this figure about $500,000. Estimates I have obtained from MOWD would indicate this sum would add no more than 40 metres to the end of the Wellington motorway. A comparison between the relative potential contributions to the economy of 91,000 S.U.s and the last 40m of the Wellington motorway may well give cause to question the national priorities on roading finance.

Because of the nature of the soils discussed earlier, phosphate fertiliser is essential for production on this country. Traditionally superphsophate use has fluctuated widely, depending on its price relative to meat and wool returns. The distinguishing features of the Taranaki hard hill country of low soil fertility and good soil structure, relatively mild temperatures and good, evenly distributed rainfall, mean that competition on grasslands from low fertility species such as manuka and ferns is severe. A minimum amount of phosphate is required to provide enough soil fertility to give (particularly high fertility demanding species) grasses competitive advantage. If this is not applied reversion can be rapid. To sustain production from the hill country, this minimum amount of phosphate cannot at present be financed from the earnings received from current product prices at current production levels i.e. currently, it is uneconomic to farm much of Taranaki's hill country.

However, to write off the hill country on this basis would be negative thinking to the extreme as this hill country offers by far the greatest potential for increasing agricultural production in Taranaki as demonstrated by the following example using 3 farms i.e. Stratford Demonstration Farm,

TABLE 4. COMPARISON OF WAIMATE WEST AND STRATFORD DEMONSTRATION FARMS WITH A WHANGAMOMONA HILL COUNTRY FARM.

	Waimate West	Stratford	Whangamomona Hill
Altitude	100m	300m	300m
Topography	Flat	Flat-Easy	Easy-Steep
Pasture type	Ryegrass White Clover	Ryegrass White Clover	Browntop
Annual Production (kg DM/ha)	14000	11000	5-6000
Current Stocking rate (L.S.U.)	25	21	8
Recent annual maintenance super phosphate (kg/ha)	O-200	500	60-125
Typical Olsen soil test levels (ppm)	60-80	20-30	O-10
Estimate total phosphate applied (t/ha)	25	15	2

Waimate West Demonstration Farm and a typical Hill Countrv farm at Whangamomona (Table 4).

At Waimate West and Stratford soil phosphate levels are such that phosphate has ceased to become a limiting factor to pasture production. Thus the difference in annual DM production between Waimate West and Stratford are of climate as related to altitude. With the same basic soil characteristics and climate it could be expected that Whangamomona would equate with Stratford. As they do not there must be other important differences.

The first obvious difference is slope. Greater slope will affect annual DM production by more rapid depletion of soil water reserves, With Taranaki's regular rainfall slope effect on soil moisture will be of minimal significance. This reduces the major factors distinguishing the Stratford and Whangamomona pastures to past and current P inputs, and grazing managements.

Stratford and Waimate West have achieved their ryegrass/ white clover dominant pasture through a combination of high P inputs and intensive rotational grazing. The first provides the base from which the high fertility demanding ryegrass/ white clover can compete, the second assists that competition.

In the hill country the reverse is happening. With low P levels any ryegrass/ white clover is struggling to survive. In addition the close, more selective grazing by set stocked sheep ensures a highly preferential harvesting to ground level for these much more palatable species resulting in browntop dominant pastures. Fertiliser and grazing management in combination have been the key factors in converting from browntop to high producing pasture at Waimate West and Stratford and the same must apply to the hill country.

Because of the high phosphate retentive nature of Taranaki soils, a very high proportion of applied P is immobilized in the soil particles and becomes unavailable to plants. With enough total P applied this phosphate fixing mechanism of the soil must eventually become saturated,. and a true maintenance topdressing situation reached, i.e. one where the only phosphate required is a replacement for that lost from the cycle. It is quite probable that this situation has been achieved at Waimate West where no P has been applied in the last 3 years with no drop in pasture production. At Stratford, maintenance applications of 500 kg/ ha/ year are slowly increasing Olsen soil test P levels, and it would be reasonable to postulate a proportion of applied P is still being fixed and that ultimately, annual P maintenance requirements will drop to levels required to replace lost P, as at Waimate West.

These total applied P levels have not been approached on the hill country. There would be little hill country pasture that had consistently averaged more than 125 kg/ ha (1 cwt/ac) for the 30 years we have had aerial top dressing i.e. 3.75 t/ha total. Farmer experience quotes a minimum of 2.5 t/ha basic dressing to establish permanent ryegrass/ white clover in the hill country. My inclination would be at least double that before anything like the true maintenance situation is approached. It is only within the last 10 years that the

Stratford Demonstration Farm pastures have achieved ryegrass/ white clover dominance and this would have coincided with a total historical superphosphate input of about 10 t/ha. To increase productivity of the Taranaki Hill Country two interdependent items are essential, i.e. further inputs of capital super-phosphate and more intensive subdivision to allow controlled grazing management. Both, in combination are essential. Thus to prognosticate on the economics of farming Taranaki Hill Country on the basis of present production situation today is completely fallacious. The main point is that overall, the Taranaki Hill Country is not *beingfarmed,* it is still being *developed.* We can only trulyfarm the Taranaki Hill Country when we have reached the stage when a vigorous ryegrass white clover sward is the dominant herbage and as such has the competitive edge over the natural reversion to poor fertility demanding species and fern and manuka. To reach this stage requires further substantial inputs in fertiliser and fencing. However, when it is reached the economics will change dramatically. Increased pasture quantity and quality will enable more stock to be carried, with a greatly improved per head productivity.

Once it is firmly appreciated that the Taranaki Hill Country is still being developed the economics of the situation changes and can be seen in a different light. Special assistance and support to prop up a marginally viable operation may be dubious considerations, but capital investment to ensure a future realization of a much higher level of productivity at a lower cost is a completely different economic consideration. While the contribution of the LDEL has been helpful, investment in Taranaki to finish the development process which is now half way there would be a much more profitable use of the taxpayers money than starting from square one with uncleared or reverted land. Recognition of the Taranaki Hill Country as a special case in the assistance and incentives schemes is certainly a logical and warranted step.

HORTICULTURE

While in Taranaki the Hill Country offers the biggest potential for future increases in production, the glamour expansion at present is Horticulture. There is an increasing awareness that much of the climate and soils of Taranaki are ideal for a wide range of horticultural production. In 1976/77 there was 396 ha in commercial horticultural production in Taranaki (Dept. Statistics). By 1979/80 this had risen to 1788 ha in production or planted in shelter with that intention, and a prediction of 3200 ha by 1982/83 (Taranaki Horticultural Liaison Committee). While some of the expansion is from established growers, most in Taranaki is from new entrants to horticulture, mainly part time small block owners, and to a lesser extent, diversification by established grassland farmers.

While there are some in the dairy farming industry who see this expansion of horticulture as a threat to be resisted at all costs, there is considerable potential for the two industries to be complementary, both being concerned basically with food processing, storage, transportation and marketing. The Taranaki Dairy Industry has one of the most efficient and technologically

innovative food processing industries in the world and as such it could make a significant and mutually beneficial contribution to horticulture by way of joint ventures, co-operatives and so on. As horticulture here is still at the early stage, the potential for the Dairy Industry to become involved is great, Wise and efficient use of the land should be the concern. The threat to our industry is not horticulture but rather the increasing and insidious encroachment of urban and industrial development onto our prime land.

Finally no review of Taranaki would be complete without mentioning Petrochemical developments. Many see this as Taranaki's future prosperity and equate us with the Arabs. However, we are immeasurably better off than the Arabs. When the last barrel of oil is sucked from the Middle East basically, all the Arabs will have left is a pile of sand. However, when the wells run dry in Taranaki we will still have our mountain, soils, sunshine and rain, and so, we will still be producing food, with an ever increasing efficiency. While oil may be vital to the well being and survival of western man, as an essential commodity, it must rank far behind food, and in an increasingly over-crowded and hungry world the food producer must be the man of the future.

Taranaki's and New Zealand's long term natural assets are on the ground surface not below it. The present prosperity of the province was built on the exploitation of those assets by skilled and efficient farmers. There can be no doubt that in the forseeable future, its continuing prosperity will still be as equally dependent upon those factors.