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# MARLBOROUGH GRASSLAND FARMING

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## INTRODUCTION

**In the 20 years since the Association last held its Conference in Blenheim,** the changes that have taken place in Marlborough farming are many and large, reaching into all parts of the Province.

**In the conclusion of his paper on "Farming in Marlborough" given to the** 1962 Conference, Mr J.P.Beggs stated: **"The future of Marlborough lies in its hills." It has been in fact the hills that have carried the Province through those 20 years. It is also likely to be the dry hill country and the limited pastoral downland, that will still produce the lion's share of our production in the for-**seeable future.

## LAND USE

**On the 1332 holdings in the province, the types of production are too numerous to discuss in any detail. They include production of vegetables – both** fresh and processed, vegetable seed, a wide range of orchard fruits, kiwifruit, **prime lambs, store stock, both fine and crossbred wool, beef, dairy products, town milk, deer meat and velvet, Angora fleece, cereal crops and a range of** herbage seeds. If there is a dominant characteristic of Marlborough's agriculture, it is its diversity.

**Table 1 outlines the broad land use pattern of the district and compares it with New Zealand as a whole. It can be seen that while the province contains over 5% of the country's occupied land, it has a much lesser proportion of its farms, improved land, crops and even exotic forestry. This descrepancy is also reflected in stock numbers which are given in Table 2. The total stock units** carried represent only 2.0% of the national total.

**Table 1: MARLBOROUGH LAND USE ('000 ha), 1980**

| | Marlborough | % of N.Z. Total |
|---|---|---|
| Holdings | 1332 | 1.9 |
| Farmed Area | 1144 | 5.4 |
| Improved Area | 241 | 2.5 |
| Crops | 10 | 2.3 |
| Native Pasture | 473 | 10.1 |
| Plantations | 18 | 2.1 |
| Others | 402 | 7.0 |

Source: 'Agricultural Statistics, 1979-80'

**Table 2: MARLBOROUGH STOCK NUMBERS ('OOO), 1962 AND 1980**

| Year | Sheep | Beef Cattle | Dairy Cattle | Total S.U. |
|---|---|---|---|---|
| 1962 | 1272 | 51" | 20* | 1493 |
| 1980 | 1611 | 107 | 21 | 2105 |
| % Change | +27 | +109 | +4 | +41 |

Source: Department of Statistics.
* As at 31 January — all others as at 30 June

The proportion of "improved land" in Marlborough is very much lower than for the nation as a whole and the proportions of "native pasture" and "other land", very much higher.

## TOPOGRAPHY AND CLIMATE

Both the very wide range of types of production, and the apparent under-development of the Province, result from the unique topography, climate and soils patterns of the district.

The topography is basically one of hilly to mountainous ranges with altitudes ranging from sea level, up to well over 2000m a.s.l., separated by river valleys in which are found the very limited areas of flat land. There is also a very limited area of easy or rolling contoured land, with most of the Province being classed as steep. The largest areas of flat and terraced land are found on the lower flood plains of the Wairau River, the Awatere River and the areasurrounding Kaikoura.

The district's climate is varied in the extreme, with rainfall ranging from as low as 600 mm over extensive areas, to as high as 2500 mm in others. The driest areas are generally in the lower half of the Wairau Valley, together with all the land running through the Seddon and Ward areas. Generally rainfall increases as one moves inland, though the upper Awatere area and much of Molesworth Station provides a significant exception to this rule. Rainfall rises rapidly north of Blenheim providing part of the striking contrast between North Marlborough and the areas south of the Wairau River.

Frost is a common feature in all areas except those directly influenced by a coastal effect, and the number of sunshine hours recorded at Blenheim is regularly in the order of 2400 to 2500.

In the lowlands, low rainfall is aggravated by high rates of moisture loss. Water balance data for the Blenheim meteorological station, over the past 40 years (Table 3) indicates that the ability of rainfall and stored soil moisture (75mm stored water capacity) to provide the calculated needs of evapotranspiration to allow maximum growth of pasture occurs only over the four months of June to September. Pasture growth can theoretically be limited by moisture availability on average, for 124 days or 34% of the year. Annual evapotranspiration, or potential moisture loss, is 50% higher than annual rainfall.

Table 3: DAYS OF WATER DEFICIENCY, BLENHEIM, 1941-1982

| Month | Number of days | % of Months |
|---|---|---|
| January | 24 | 100 |
| February | 21 | 100 |
| March | 17 | 98 |
| April | 10 | 83 |
| May | 3 | 35 |
| June | 0 | 5 |
| July | 0 | 0 |
| August | 0 | 0 |
| September | 0 | 3 |
| October | 7 | 61 |
| November | 19 | 98 |
| December | 23 | 100 |
| Year | 124 | 100 |

Source: New Zealand Meterological Service

## SOILS

The soil pattern broadly reflects the topography and climate outlined. At the last Conference, Gibbs & Vucetich (1962) gave an excellent outline of the soil and land classes of the Province. They distinguished initially between soils of flat lands on the one hand, and of rolling, hilly and steep lands on the other. The-rolling, hilly and steep lands were further subdivided, firstly on whether they are lowland or high country (above approximately 600m, depending on aspect) and secondly by the presence and severity of an annual dry season.

The soils of the flat lands are of extreme variability, ranging from well structured deep silts, through poorly drained clay soils to raw stony soils of recent formation. Gibbs & Vucetich (1962) estimated that flats comprised only 13% of the province and that only slightly over 1% was suited to regular cropping.

The soils of the dry areas are generally yellow-grey earths, showing very little nutrient leaching, often naturally high nutrient status and very low phosphate and sulphate retentions. Moisture is the. most limiting factor for pasture growth.

Soils with only a weak dry season have suffered greater leaching losses, have generally higher fertiliser requirements and are broadly classified as yellow-brown earth – yellow grey earth intergrades.

Yellow-Brown Earth soils have been formed on the much more severely leached land of the areas without an effective dry period. These generally constitute the soils of lowest natural fertility, highest fertiliser demand and also strongest potential for reversion.

Gibbs & Vucetich (1962) also attempted to suggest the potential for agricultural use of various soil areas. They suggested that hill and steep soils with

few limitations to farming comprise some 23% of the Province, that a further 29% is of hill and high country soils that can be farmed despite limitations, but that as much as 33% of the Province is considered to have limitations too severe to permit farming.

More recent studies of all or parts of the district, and particularly those that have taken some account of current economics, have suggested even larger areas unsuited to agriculture, (Marlborough United Council, in print).

## LIVESTOCK AND FARMING TRENDS

Table 2 shows in brief the make-up of the province's livestock numbers, and the changes in numbers since 1962. The increases shown are broadly in line with national trends in the same period, with Marlborough sheep numbers lagging a little, but the increase in beef cattle being well ahead of national trends, and dairy cattle numbers showing almost the reverse of national trends. When looked at in more detail the figures also show a continued high proportion of dry sheep (34% of sheep stock units), a still low proportion of beef cattle and of course the relative smallness of the dairy industry.

The moist areas, with climate and soils akin to much of the North Island, have similar types of sheep farming. This type of farm is generally found north of the Wairau River and in the Marlborough Sounds. High fertiliser inputs, high costs and reversion problems have resulted in a reduction in the number and extent of farms in this area over recent years. It is also this area where exotic forestry has had its greatest impact.

The high country is another discrete section of the livestock industry. Runs which are classified as high country make up almost 50% of the occupied area of Marlborough (Tussock Grasslands and Mountain Lands Institute 1974). but comprise only 22 properties (including the 182,000 hectare Molesworth Station, farmed by the Department of Lands and Survey) and carry only 6.7% of the sheep in Marlborough, 23% of the province's cattle production and produced only 7.0% of its wool clip.

Since those figures were produced, land retirement has reduced the occupied area and stock numbers have increased. It is still apparent however that the high country does not contribute a great deal to Marlborough's total production. Recent developments, extending to the high country techniques of top dressing, legume over-sowing and particularly more intensive grazing systems utilising electric fencing, have shown the 'large potential to be tapped in these areas, despite the limitations imposed by severity of climate.

The bulk of the province's increase in stock numbers over the past 20 years has been on the relatively dry hill country, south of the Wairau River and below about 700 metres. Figures provided by the Rural Banking and Finance Corporation show that some 310 Land Development Encouragement Loan programmes were approved in Marlborough. This represents in the order of 40% of all farms which could have been eligible for the scheme. The uptake of the Livestock Incentive Scheme has been similarly well ahead of any national responses. It is, and it will continue to be, the hill country with a severe to moderate summer dry period that we must look to, to produce the lion's share of Marlborough's export earnings. The potential to continue expansion is still there. Sykes (1980) suggested a doubling of animal production, based on biological considerations. The Marlborough Primary Production Study (in press) suggests an increase in stock numbers of 53% in 30 years, but also emphasises that a disproportionately

large share of this must come from the dry hill country.

While dairy farm numbers have declined to the present figure of approximately 100, and the number of dairy factories has recently been reduced from 4 to 2, the number of cows has expanded over the years and the industry is at present staging something of a resurgence.

## CROPPING AND HORTICULTURE

The wide range of significant crops in the district is shown in Table 4. The move into horticulture, which is carrying on nationally, is driving ahead apace in this district.

**Table 4: MARLBOROUGH CROPPING: ESTIMATED AREAS OF FARM AND HORTICULTURAL CROPS, 1981-82**

| crop | Area (ha) |
|---|---|
| Grain crop | 3400 |
| Peas (seed) | 1000 |
| Herbage seed | 1900 |
| Process vegetables | 850 |
| Vegetable seed | 350 |
| Fresh vegetables | 180 |
| Grapes | 1200 |
| Stone fruit | 180 |
| Pip fruit | 175 |
| Berry fruit | 13 |
| Kiwi fruit | 12 |

The crops showing the greatest expansion in recent years have been grapes and stone fruit, two permanent crops to which our soils and climate, given the availability to water for irrigation, are well suited. The area of pipfruit, a traditional crop, has also started to expand as the supply of planting material has started to catch up with demand.

The crops of declining area in recent years have been the seed crops. In the case of vegetable seeds, both the area and the range of crops has reduced substantially. Similarly there has been a decline in the area of herbage seed production. In the last three years the entries in the Certification Scheme in Marlborough have dropped by approximately 5% per year. In part this reflects the decline in demand for both lucerne and red clover, two traditionally important crops. The base of herbage seed production however, while now somewhat smaller, is certainly wider, in range of crop, than it was.

The future expansion of the horticultural industry must be uncertain, by the nature of most of the industry. It appears that the bulk of the expansion in grapes may be over, though the uniquely favourable local conditions should continue to benefit this district. Many of the other permanent crops will also expand, but the direction of development is, in many ways, outside the hands

of the grower and in the hands of the potential process manufacturers and marketers.

The Marlborough Primary Production Study (in press) suggested a 70% expansion in the area in cropping generally was likely.

## PASTORAL FARMING CONSTRAINTS AND OPPORTUNITIES

As has been outlined, much of the future development of the Marlborough pastoral industry will take place on the relatively dry hill country. It has also been suggested that livestock production could be doubled. This target would require continued physical land development, and management systems which allowed better feeding of stock, while also allowing for increased stocking rates.

The techniques required for development are now relatively well known. In many areas they constitute the basic use of topdressing, oversowing and subdivision. The development of the electric fence has been, and will continue to be, of major benefit to an area such as Marlborough. The remaining barrier to further subdivision and intensification on much of the dry hill country is the provision of stock water. This input becomes a more costly and more important factor when intensive subdivision is put in and particularly with the impact of rotational grazing.

Increasing stock numbers on the dry hill country however, is a two-edged sword. It brings with it increased pressure on the farmer's ability to finish stock. The vagaries of the climate, the propensity to very dry summers, the lack of adequate down-land to compliment the hills, and the district's isolation from other potential store markets compound the farmer's problem. Delays in finishing revenue stock aggravate a problem of rearing young capital stock.

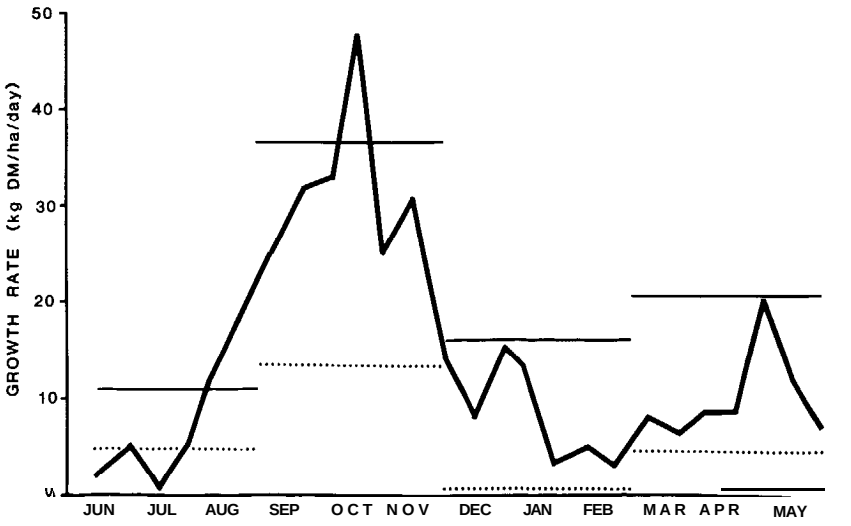


Fig. 1: *Seasonal pattern of pasture growth rates, and highest ( ——— ) land lo west ( ---- ) mean seasonal growth rates in the Wairau Valley, 1974-78*

The impact of the climate is reflected in the pasture growth pattern shown by a four year rate of growth trial (Clare unpublished Fig. 1). This illustrates the wide discrepancy in growth between the four months of spring and any other period.

There is also an inevitable drop in feed quality and intake, associated with excess spring growth, falling soil moisture levels and high temperatures. In many cases it is this that is the greatest problem as it prevents finishing of lambs, and consequently the early lightening of stocking rates, and it also prevents the lifting of ewe liveweights and subsequently the achievement of ewe flushing and adequate tupping liveweights. Fig. 1 illustrates the ranges of seasonal growth rate, emphasising that not only is growth extremely seasonal, it is also uncertain.

The effects of this uncertainty and periodic dryness are illustrated by the trends in livestock numbers over the past ten years. Analysis of the sheep and breeding ewe numbers in the province between 1970 and 1981 show that numbers peaked at something over 1.4 million head in 1972 immediately prior to the major drought of 1972-73. As a result of that drought, numbers fell by approximately 10%, and did not recover to the previous high level until 1978, a lapse of six years. While this delay is in part the result of biological constraints, a major reason is farmer attitudes and the feeling of vulnerability.

Pasture plants and mixtures capable of extending the period of growth, and particularly the period of feed quality, could be of great benefit to this district. Lucerne has traditionally performed this role in part at least, but the lucerne area has dropped dramatically in recent years. The reasons for this decline in the popularity of lucerne are several. No doubt the period of relatively moist seasons, when weeds in lucerne became a greater problem and when the advantages of the plant were less apparent had an influence. However, also of major importance has been the appearance of a number of pests and diseases which have combined to shorten the reasonably expected life of a lucerne stand and, more importantly, have sapped the confidence of the farming community in this useful plant. The costs of maintaining a substantial area of lucerne have undoubtedly risen substantially, particularly on land where cultivation is difficult and expensive, as is much of the flat land on Marlborough hill country properties.

Conservation of hay and particularly silage to maintain spring pasture quality, and provide strategic supplementary feeding, the irrigation of areas of land to complement the hills and the use of crops will have a role in future developments. Because, however, of the nature of the district and the extremely limited area of flat land, most of these constraints must be overcome on the hills.

At present limited areas of special purpose pastures are being developed on some farms and many farmers are employing rotational grazing techniques to improve feed distribution and quality and consequent stock liveweight. Lambing date adjustments, early weaning and early culling of stock are also techniques aimed at early reduction in summer stocking rate. The uncertainty of late spring and autumn feed however remains the major constraint to hill country intensification.

## CONCLUSION

Over the past 20 years, Marlborough pastoral farming has developed at rates similar to those of the nation as a whole. The potential for hill country development remains very large and is being tapped at present. To fully utilise this po-

tential however, we must develop systems that to some extent would close the gap in production of high quality feed in the late spring and early summer, and again in the early autumn. Given this, on the hill country, and on the limited areas down-country, the predictions of increased pastoral production ranging from 50% to 100% can be met.

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