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## DEVELOPMENT OF A DRYLAND FARM

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### *Abstract*

Over the past 13 years the property described has proved a worthwhile investment. Carrying capacity has been increased by 260%, and high performance stock have been maintained; ewes have averaged 135% lambing. The property was first developed into a dryland lucerne unit, and in later years to an irrigation farm. This has been achieved with 2 labour units, and extended working hours.

### INTRODUCTION

THE 304 ha property, "Temby", was purchased in 1961. It was subdivided into 10 blocks, some fences being good, others being in a bad state of disrepair. Poor pastures covered 242 ha, there were 24 ha of Wairau lucerne and browntop, and small areas of Achilles greenfeed oats and crop stubbles.

Financing for purchase was through a private company involving the writer as a working partner, and an experienced farmer, who was also farming in his own interest. As only 50% of the company capital had been borrowed, the aim was to, develop out of income.

"Temby" is located on the Lower Waitaki Plains, 25 km north of Oamaru. It bounds the Waitaki river on the north side and it comprises three flat river terraces dropping to the river.

Soils are light, stony, alluvial river flats, free-draining and droughty. According to the soil map, most are Papanua stony sandy loams and very stony silt loams.

Climate and soils dictate pastoral dryland farming. The average rainfall is 500 mm, but on many occasions it has been lower than 400 mm. Summer droughts are predictable and the winter extends over 100 days.

### DRYLAND FARMING 1961 TO 1965

Although the property has been extensively limed, little superphosphate had been used. Pastures consisted of browntop (*Agrostis tenuis*) subterranean clover (*Trifolium subterraneum*), some 'Grasslands Apanui' cocksfoot (*Dactylis glomerata*), hairgrass (*Vulpia* sp.), barley grass (*Hordeum murinum*), and nodding thistle (*Carduus nutans*).

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Subdivision was into 24 ha blocks. Half the farm was top-dressed immediately, the best paddocks being selected. The response was spectacular, providing adequate autumn and winter feed, which in turn led to foot abscess and footrot.

First development thoughts when purchasing the property were to sow out a major proportion in lucerne and irrigate the lower part of the farm directly from the river. With light soils and low rainfall 'Grasslands Ruanui' ryegrass (*Lolium perenne*) and 'Grasslands Huia' white clover (*Trifolium repens*) pastures lasted only three years. Time and money were not going to be wasted continually sowing out new pastures.

Lucerne was the only grazing plant that could survive on these soils, so the area of this had to be increased as fast as possible. All pastures were weedy, so time was necessary to work all paddocks through a series of winter feed crops and some cereals.

Turnips and 'Grasslands Paroa' Italian ryegrass (*L. multiflorum*) were the main winter feed crops. A low yielding cash crop of Aotea wheat was tried at first, but a change to oats was made to provide feed insurance against summer droughts, using the grain and straw.

To make additional cash, ewe hoggets were grazed in the winter and 4 ha of marrow-stemmed kale were sown each year for seed.

Stock performance in these early years was good. In the first year, as a result of the topdressing, 150% lamb survival to sale resulted. Wool weights were round 4.5 kg per ewe.

By the autumn of 1965, four years after purchase, stock numbers had increased 120%, giving an overall carrying capacity of 7.9 stock units/ha. This was due to an increase of 300% in lucerne area, 80 ha of turnips and grass for winter feed, and double the number of paddocks.

First-cross Border Leicester, Romney, and Corriedale ewe hoggets were replacing the Romneys. Although the lambing performance had been, high, Border-cross ewes lambed more freely and they can adequately feed up to 3 lambs per ewe.

#### IRRIGATION DEVELOPMENT

##### ACHIEVEMENTS

In 1965 a water right was granted and 18.5 ha were border-dyked. The area was sown out in April with Ruanui ryegrass at 24 kg/ha, Huia white clover at 3 kg/ha, and a 4 kg/ha mixture of crested dogstail (*Cynosurus cristatus*), 'Grasslands Kahu' timothy (*Phleum pratense*) and subterranean clover.

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This irrigated block provided summer maintenance feed for ewes which were grazed on an on-off basis. The lambs remaining after weaning were rotationally grazed on lucerne. This irrigated feed replaced the supplementary ration of oats and oat straw that was fed to ewes in the summer-autumn period prior to irrigation.

The more lucerne and the more stock carried, the bigger the summer feed problem became. Irrigation was the obvious answer and would allow diversification into stock other than sheep.

In 1967 approval was given for further water to be used for border-dyke irrigation. Today over half the farm is in irrigated pasture. Very soon this will increase to 70%. The remainder of the farm will be in dryland lucerne and trees.

Lambing performance has averaged 135% and wool weights have been 4.5 kg per ewe with numbers peaking over 2000 before swinging to cattle. Calving percentage is 90. There has been some trouble with calves not growing well, but this would now appear to be a selenium deficiency. All stock need this element.

#### BLOCK APPROACH

One of the biggest upheavals faced was the removal of recently erected subdivision fences. It was fortunate that these fences were electric and an eye to irrigation did help to soften the blow.

As border-dyking involves working with the contour as much as is practical, most fences have to be removed as these do not follow natural land forms. Then, when an area is planned a whole block can be looked at, not just a paddock.

Planning for a border-dyke layout is essential. Winchmore staff assisted with the first block. After this I planned the layouts, taking the whole farm into consideration. The direction of fall was obvious and this made the job easier.

#### TIME TO BORDER-DYKE

There are many factors which affect the best time to border-dyke. It may be to fit in with labour availability, crop rotations, feed supply and, most important, availability of contractors—different seasons have advantages and disadvantages.

All seasons have been tried, and the biggest factor taken into account has been a minimum disruption of stock carrying capacity. Labour availability would be the next. In order to avoid stock disruptions, early spring border-dyking has been preferred after a winter feed crop, and summer border-dyking after lucerne.

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**PASTURE ESTABLISHMENT**

In the early stage of border-dyke development, pastures were oversown with wheat and barley. Wheat yielded 0.8 tonnes/ha and paid part of the bill. But the pastures under these crops suffered. In comparison with pastures sown alone or with rape, these oversown pastures were 2 years later in reaching maturity and for this reason the practice was stopped.

The pasture mixtures have basically been Huia white clover at 3 kg/ha, and both Ruanui and Ariki ryegrasses at 20 kg/ha. Although Ariki is a better autumn producer, it appeared to be less palatable than Ruanui and was sown only once on its own. A mixture of the two has since been sown, on the premise that the stronger would survive.

A paddock is grubbed, harrowed and rolled a number of times after border-dyking to prepare for sowing. A roller drill is used because it has 75 mm centres; coulter drills with split coulters are liable to breakages in stones. Drilling has been tried up and down the border-dykes and across. The latter in dry weather flattens dykes. Up and down drilling is favoured as it is easier on driver and machinery. A small roller drill is used on the dykes.

Money has been spent on nodding thistle and barley grass control, but little has been spent on grass grub (*Costelytra zealanctica*) and porina (*Wiseana* spp.)

**FIRST IRRIGATION**

This irrigation is most important for good pasture establishment if the soil is dry. Of course, this means dams and sills must be installed. Constant supervision is required for this first watering and, because there is no grass around the sill area, scouring can occur. To overcome this, plastic sheets are tacked to the sills. Vigorous pastures from the start ensure a ryegrass/white clover-dominant sward over a lifetime.

**SUBDIVISION**

Electric fences were a must because they are half the cost of conventional fences. Without these, subdivision would have been less intensive. They allow headraces to be fenced, giving better water control and protecting these expensive structures from lambs and cattle.

The extra subdivision gives the opportunity to rotationally graze, with the subsequent results of better utilization, better pastures,

and more production. Paddocks now average between 6 and 8 ha. Any future subdivision will be into smaller blocks. These will allow longer rotations which are especially important in winter.

### STOCK

In 1970 the change from sheep to cattle began. In June, 2760 sheep were carried; the following June this was reduced by 360 and 100 eighteen-month heifers and 100 weaners were bought. The change was made because long-term prospects for cattle prices looked better.

Stock units wintered this year were 4500, an increase of 60% on the numbers before irrigation. These are made up by one-third of sheep, weaners and breeding cows.

Ewes are typically flushed on headrace areas and wintered on hay and grain, fed out on lucerne paddocks. Prelambing feed is varied, but usually it is some pickings from irrigated pasture, on which ewes are lambed then moved on to lucerne in the third week of September. They remain on this till weaning and the ewes are then used to keep the headraces grazed.

Weaners are bought in April and wintered at 5/ha on irrigated pastures, shut since February. One-third of their winter ration is bought-in straw. These weaners are sold usually as forward stores any time from December through to February, depending on prices offered. Cows are grazed on the farm for only 7 months of the year. At weaning in February they are grazed on crop stubbles around the plains. In late autumn to early winter they return to the farm and are moved to a leased river island and fed roughage and straw.

In August, cows are grazed on irrigated pastures to boost them before calving. Lucerne hay is fed to the cows from calving to October, the cows being stocked at 3.3/ha. They are rotationally grazed till weaning.

The overall stocking plan has been flexible as the property has been in a continuing state of development. Up to 5200 stock units have been carried in the spring and summer. Numbers of stock have been influenced by prices and the integration of stock with available feed.

### DEVELOPMENT PRIORITIES

The rate of development has been entirely reliant on surplus revenue. The object has been to concentrate on expenditure items that will increase income. To this end topdressing and pasture

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improvement plus the essential' facilities to service this increased carrying capacity were selected.

The sequence followed has been topdressing, lucerne, border-dyking, subdivision, shelter, haybarns and yards. It is only now that an extra house has been built and old sheds are being replaced. Expenditure on plant has been kept to a minimum, as I am a member of a machinery pool.

By following these principles and by taking every advantage 'to discuss the management decisions with my partner and other interested servicing personnel, this venture has given job satisfaction and it has been financially successful.

Irrigation has reduced costs and guaranteed a carrying capacity of 20 to 25 stock units/ha. Any stock can now be grazed-sheep, beef, deer, rabbits, you name it.

With new grasses like 'Grasslands Nui' soon to be available, who knows what will be carried in the future on irrigation farms on the Lower Waitaki Plains? In the meantime I am continuing to develop with confidence.

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