

FARMING IN CENTRAL OTAGO

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CENTRAL OTAGO has a lore and a lure which set it apart from the rest of New Zealand. Its characteristics of geology, topography and climate, its history of occupation and exploitation, its scenery at once forbidding and yet strangely fascinating—these features combine to cast a spell from which few who have been exposed can ever fully escape.

There is no formal boundary to the region. For the purposes of this paper it is defined as the area bounded by the Carrick and Old Man Ranges to the south, by the Lammermoor and Rock and Pillar Ranges to the east, by the Hawkdun and St. Bathans mountains, on the north, and west to Lakes Hawea, Wanaka and Wakatipu.

Early Development

The history of Central Otago holds variety and excitement enough to warrant a paper in its own right, but only a few of the highlights can be included here.

One of the first Europeans to explore the region was Mackenzie, the famous sheep-stealer, and although his exact route is a matter of conjecture, he certainly brought sheep through the area on his way from the Levels to Southland.

In the period 1857-9, sheepmen followed hard on the heels of surveyors in exploring, mapping and laying claim to inland Otago. They found extensive, tussock-covered mountains and valleys, an absence of trees, but with considerable areas of matagouri and manuka shrublands—overall, a grassland vegetation, inhospitable to the explorer, but almost ready-made sheep country for the grazier.

In 1858 depasturing licences were given to the Shennan brothers over the 100,000 acres of Galloway and Moutere stations, to John Maclean over nearly half-a-million acres in the Lindis-Tarras-Hawea area, and to Robert Wilkin

over Wanaka Station, and by 1859 all suitable land had been taken up. An interesting point is that at the first shearing at Galloway in 1858, shearers received 15s. plus three glasses of rum per eight-hour day.

Gold was found near Lawrence in 1861. In August, 1862, Hartley and Reilly deposited 87 lb of gold in the Treasury in Dunedin, claimed the £2,000 reward offered by the Provincial Government, and reported the site of their discovery as the (then) Molyneux Gorge. Immediately the Central Otago gold rush was on.

For the next 40 years, the search for and the rewards from gold dwarfed agriculture as the major enterprise in Central Otago. More than E35 million worth of gold has been won, and although the countryside still bears witness to the ravages of mining, sluicing and dredging, there is no doubt that the present agricultural pattern, the form and rate of its early development owe a great deal to its mineral wealth. Dunedin became a wealthy, important economic centre, road access was provided, community centres and services sprang up throughout the area, and, as mining activity diminished, some miners remained to provide a labour force.

The first and most important use for water was to assist with mining operations. However, as early as 1864, a French settler named Ferraud obtained a water right which he used to irrigate 40 acres of fruit trees and market garden near Clyde. Results were outstanding, and as quickly as water was not required for sluicing it was used for irrigation. Today, there are some 10,000 acres covered by private irrigation schemes, mostly by water from mining rights, in Central Otago.

The rabbit was first reported as a pest in the area in 1876, and by the 1880s the combination of overburning, overstocking with sheep, and the depredations of hordes of rabbits was having a disastrous effect on the agriculture of the region. Sheep numbers declined and many of the early settlers were ruined.

Topography and Climate

Central Otago consists of a series of parallel mountains and river valleys, running generally north and south, cut off to the south by the Carrick and Old Man Ranges and to the north by the Hawkduns and St. Bathans. Mov-

ing from east to west, the pattern is Rock and Pillar Range, Maniototo basin, Rough Ridge, Ida Valley, the Raggedies, Manuherikia Valley, Dunstan Range, Clutha Valley, Pisa Range.

The western side of each valley is a steep, scarp face, relatively moister than the easier but more exposed eastern slope. Except for the Maniototo, the valley floors are narrow compared with the distance between mountain crests.

The position of Central Otago in relation to the Southern Alps and its situation as the most inland part of New Zealand have a profound influence on its climate. The effects are low rainfall and temperature extremes—hot and dry in summer, cold and dry in winter. The average annual rainfall in Alexandra is about 13 in., the range over the last 35 years being a maximum of 19.5 in. in 1945 down to 8.6 in. in 1964. Much of the Maniototo and the Cromwell-Tarras area receives less than 18 in. per annum, the rainfall increasing as one moves out from the arid “core” to 32 in. at Hawea and Queenstown, 30 in. at Raes Junction, and 45 in. at Glenorchy. It is interesting to note that between Alexandra and the Homer Tunnel—roughly 60 miles—the *difference* in average annual rainfall is over 250 in.; in the ten or so miles between Alexandra and the top of the Old Man Range, the difference is estimated as over 30 in. per annum.

The wettest months are late spring/early summer, the driest months July and August. This marked summer concentration of rainfall, coming when temperature and insolation are high, accentuates the dryness of the region. Round Alexandra, potential evapotranspiration is almost twice the average rainfall for the year, and from early October until April conditions of soil moisture deficiency can be expected.

Summer temperatures of over 90°F are not uncommon, the average daily maximum for January at Alexandra being 74°. The diurnal variation is considerable—for example, it averages 23° in January.

Extreme minimum temperatures go down as far as Ophir's —3.5°, Alexandra's best effort being 4° (28° of frost), and the average daily minimum here in July being 28° F. Alexandra has an average of 157 days of ground frost, and 89 days of screen frost per year.

Types of Farming

The broad picture is one of extensive run country on the higher terraces and hill and mountain country, and irrigation farming and fruitgrowing in the valley floors.

EXTENSIVE RUN COUNTRY

At the time of settlement, inland Otago was described as "all open, well grassed and watered, with sufficient scrub for fuel for many years but no bush or timber". The early sheepmen had to learn by trial and error methods how to convert the tussock grassland into suitable feed for sheep. They had to evolve a system of grazing management and to find out how many sheep their country could support. It is all too easy to speak now of overburning and overgrazing—the deserts of Central Otago were man-made indeed—but only by bitter experience was it made obvious that in this arid environment mistakes in land management have dramatic long-term consequences.

Holdings tend to be large. The sheep are merinos on the drier, harder country, half-breds with some corriedale flocks on the easier properties. This run country has built up an enviable record as a producer of quality wool. The size and reputation of the Dunedin wool sales have their foundation in the clips from Central Otago.

Winter snow level is usually round 3,000 ft, higher perhaps on country lying to the north and west, lower on sheltered aspects. In Central it is the lower winter country which is depleted, the higher summer blocks in general being reasonably well vegetated.

This region was the home of the rabbit and for 75 years from the mid-1870s this pest remained as a blight over the land. On many properties, revenue from the annual harvest of rabbits ensured continued occupation. The per acre, year-round grazing intensity on many areas must have been extraordinarily high. The operations of the Rabbit Destruction Council, working through local rabbit boards, wrought an unbelievable transformation throughout Central Otago in the 1950s. It cannot be said that rabbits are no longer a problem, but the level of control which has been achieved has opened out horizons as to the potential of the country. With rabbit control, with improved conditions of Crown lease following the

1948 Land Act, with the research findings in the fields of topdressing and oversowing, and with a generally favourable economic climate, many runholders have embarked on development programmes undreamed of only 15 years ago. Rehabilitation of denuded, sunny slopes in the heart of the "badlands" remains a problem, but over much the greater area of terrace and hill country, up to about 3,000 ft of Central Otago, lack of knowledge and example are no longer the principal bars to progress.

IRRIGATION FARMS

Provision was made in the Mining Act of the 1860s to allocate the available water in Central Otago, under a system of water rights, to individuals or syndicates for either irrigation or mining. All local streams were very quickly developed, initially almost exclusively for mining, but, with the working out of the gold claims, more and more for irrigation.

The potential of this type of irrigation development was limited—supply was by gravity, the water resources for such a system were limited and unpredictable, and improvement depended on the interest and resources of the individual.

However, results were frequently spectacular and early in this century Government commenced investigations into the provision of major irrigation schemes in Central Otago. In 1906, the first survey was commenced in the Maniototo basin, then in the Ida and Manuherikia Valleys. The Ida Valley scheme was the first to be constructed, water being turned on in 1917. Subsequent development has been rather in fits and starts and at present there are 15 government-operated schemes covering almost 65,000 acres in Central Otago. The 16th scheme, at Hawea, designed to cover 2,350 acres, comes into operation this year.

Considering the arid climate, the area of valleys and terraces, and the fact that there is a considerable water resource available in the major river systems of the area—the Clutha, the Manuherikia and the Taieri—one would think that irrigation must be the touchstone to Central Otago's development and prosperity. Such is not the case at present, however, and an assessment of the doubts and difficulties might well include the following points.

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- (1) Cost of providing further water. The economic possibilities of supply by gravity are becoming exhausted. The heavy cost of raising the comparatively large amounts of water by electricity to the required height along the river systems is likely to be accepted only under a scheme of small-scale, insurance-type irrigation.
 - (2) Topography is a problem, only a comparatively small proportion of the potentially irrigable land being suitable for border dyking. Most existing irrigation is by contour ditches and wild flooding, suitable in times of cheap, plentiful water and reasonable labour supply, none of which conditions pertain today.
 - (3) The diversity and pattern of distribution of soil types throughout the valleys and basins present difficulties. Some of the soils are eminently suited to irrigation, others are not, and the soil map shows just how jumbled together these different types are.

Current regulations require that irrigators covered by any new scheme shall pay annual water charges sufficient to cover interest on one-quarter of the capital cost involved, plus depreciation on the wasting assets, together with the costs of operation and maintenance. During the first 10 years of operation the irrigation charge to the farmer starts at a low rate, building up to the maximum after the tenth year. Taking the new Hawea scheme as an example, water charges are to be of the order of 3s. to 4s. per acre in the first year, rising to an estimated 38s. for a quota of 20in. per acre after 10 years.

It is perhaps pertinent to state here that, considering all the present government schemes in Central Otago, annual revenue from water charges is considerably less than costs of repairs, maintenance and operation.

There are some six dairy farms producing town milk on irrigated land in Central Otago. Except for these, virtually all the rest of the irrigated farm area is given over to fat lamb production. Average carrying capacity on the watered area is probably 3 ½ to 4 sheep per acre, but there are farmers who have reached 7 ewes per acre.

DRYLAND FARMING

Above the irrigation races and below the hill slopes is an extensive area of plain and terrace country. Some of

this is run in conjunction with the run country above, the remainder as part of the irrigated farms, and some, especially in the Maniototo and in the Upper Clutha, is farmed in its own right.

Until comparatively recently this country held little promise for development, but, with rabbit control, and a period of good prices, the farmers themselves were the spearhead of progress. The outcome has been that over much the greater part of this easy rolling country it has been shown that lucerne and lucerne-grass mixtures can be grown and managed to give a considerable lift to production.

MIXED CROPPING

Out from the dry central core, in the Tarras, Hawea, Wanaka, Queenstown districts, there are pockets of deep rich soils used for intensive mixed cropping. Wheat, peas, barley and small seeds are the principal crops, and although the areas themselves are small, the yields achieved are very high.

In the early days of Central Otago, particularly in the late 1800s and early 1900s, cropping was extensive-much of the Teviot country, the Upper Clutha Valley, Crown Terrace, to name but some of the areas involved, were cropped year after year on a "grow oats to feed horses to grow oats to feed horses" basis, with a large acreage of wheat as well. On many of the soils this heavy cropping quickly exhausted their humus content and destroyed their structure. Erosion was induced, crop yields fell, and this land reverted to poor, unproductive grassland.

FRUITCROWING

Though not strictly relevant, mention must be made of the fruit industry of Central Otago. There are over 3,000 acres of orchards in the region, most of them concentrated in two districts, Alexandra and Roxburgh. Four-fifths of New Zealand's apricot trees are here, as also are two-thirds of the cherries and nectarines and more than half the European plums.

This, then, is the broad picture of Central Otago-a region of contrast and of extremes, a region rich in history, one which has known periods of great prosperity and

feverish activity, as well as those of disaster and despair. During this century, the wide oscillations between hope and despair, between prosperity and poverty, have been damped down. Progress may seem slow, but progress there has been, and what has been achieved so far in the agricultural development of the region is but a foretaste of its full potential.
