Development of a Small North Canterbury Sheep Run

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THIRTY years ago "Vulcan Downs" was a typical North Canterbury grazing run, well managed, when judged by the standards of that time, but in no way different from many others. Today "Vulcan Downs" is still a North Canterbury grazing run, but it is far from typical. It now enjoys a reputation of prosperity and its enviable record has been achieved solely through the unremitting efforts of its owner, Mr. Eric Gardiner. The story of some grazing runs is often a depressing one, a story of steady retrogression and ever-diminishing returns. What the ultimate fate of much of this country will be who can tell? Years of overstocking and injudicious management have left a mark which can never be erased, and the possibility that valuable country will be abandoned to scrub and second growth is a very real one.

In the light of this dismal prospect the account of the development of "Vulcan Downs" holds an even greater appeal.

This property is situated about 3 miles from the seacoast at Motunau, some 50 miles north of Christchurch. It comprises an area of 2500 acres of well-watered, warm limestone country. Some 900 acres of the property are ploughable, 500 acres being river flats of limestone and sandstone origin and 400 acres easy downs. The remaining 1600 acres is rideable hill country rising to a height of 1200 ft. at the highest point. In common with most North Canterbury coastal districts Motunau enjoys a reasonably temperate climate with an average rainfall of 34 in., which falls fairly evenly over the twelve months.

The Motunau district was first settled over one hundred years ago by the Greenwood brothers, who were whalers. Some years later the actual Motunau Estate was granted to the Holmes brothers in part payment for constructing the Lyttelton tunnel. "Vulcan Downs" was not part of the Motunau Estate - but was leased by the Holmeses. The late Mr. W. Aceton-Jones subsequently bought the gold block and it became part of the Tipapa Estate. He later sold a considerable portion of this estate, including the property under review, to a syndicate which also bought some of the surrounding country, which was subdivided and gradually disposed of.

"Vulcan Downs" block had several owners before being sold to Mr. A. P. A. Nidholls, who eventually sold it to the present owner.

Mr. Gardiner took possession of "Vulcan Downs" in 1919. Since then continuous development has taken place until the property has reached its highly-improved state. Although the property embraces the whole period from 1919 to 1948, it can be divided into three essentially different phases, the end of each phase marking a change in management policy. The first covers the years from 1919 to 1929, the second a period of 10 years terminating with the beginning of the war, and the third the war and post-war years up to March 1948.

When Mr. Gardiner took over pasture improvements, had been effected to the extent that 750 acres of the downs and flats had been ploughed and sown to good English grasses. While most of the flats held grasses fairly well, the downland and some portions of the flats showed signs of running out after three or four years, the better species disappearing and giving place to inferior grasses such as sweet vernal and hair-grass. The unploughed portion of the property had a native cover of danthonia and poa tussock, and there were some 300 acres of dense manuka scrub on portions of the downs and hills. On the flat there was an undrained swamp about 20 acres in area which was suitable only for limited cattle grazing during dry periods.

During the first five or six years Mr. Gardiner methodically went about regrassing the whole property with high-quality pasture species. Gradually all the unploughable tussock country was given a mixture of 8 lb. of cocksfoot, 3 lb. of perennial ryegrass, and a little crested dogstail per acre. After 25 years these grasses are still persisting, in fact they play a very important part in the composition of the tussock-country sward.
over the whole of the hill block, although it was originally sown only on a limited area.

During this early period the flats were drained with open drains and a pasture-sowing programme was carried out. All the ploughable downland and flats, apart from a small area of heavy flat, was turned over and re-sown. The ploughing was done with a team, and since that time only 25 acres of ground has been ploughed a second time. During the years between 1923 and 1928 practically all the downs and flats had been regrassed with a mixture of 20 lb. of perennial ryegrass, 10 lb. of cocksfoot, 2 lb. of red clover, 2 lb. of white clover, and 21 lb. of ground pork per acre. In May, 1923, a heavy rain occurred at Matamau, some 24 in. of rain falling in about as many hours. The two central areas of the flats rose higher than the other parts and the flats rose in high flood and inundated the surrounding land, depositing a layer of fine silt up to a depth in some places of over 6 ft. This flood destroyed miles of fencing and despoiled much good pasture. The softness of this sediment made it impossible to get on to the ground with a team until it had consolidated. When the silt settled the ground was similar to the first phase of development. For a few years prior to this Mr. Gardiner had been conducting experiments with only the tops of the niggerheads protruding above the silt. A deep drain was cut through the middle, the silt was ploughed and sown, and what had once been a swamp is now one of the best paddocks on the farm.

During this period of initial development much of the farm was carried by hand. The average stockting of 2500 ewes, 1000 dry sheep, and 40 breeding cows. The lambs were generally raised on pasture and fattened on the farm to readiness for sale.

The average wool clip was 2 lb. Occasionally cattle were brought in and fattened, but this happened only in favourable years and was by no means a common practice.

The year 1930 is a milestone in the history of "Vulcan Downs" and marks the end of the first phase of development. For a few years prior to this Mr. Gardiner had been conducting experiments with artificial fertilisers, and though the results were by no means conclusive, they were sufficient-ly encouraging to warrant a radical change in management policy. Convinced that continuous pasture replacement was too expensive to be carried on indefinitely, he decided to form a team and implements, bought a crawler tractor and topdresser, and started a manuring programme. In the third and subsequent years after team work, in addition to the 40 tons of fertiliser used annually, for one year were 80 tons were sown. Even during the early years of the manuring phase Mr. Gardiner was continually experimenting with different fertilisers, and actually the 80 tons used in the peak year was a mixture made up of one-third 44/46 superphosphate one-third Walpole Island guano, and one-third blood and bone. Other fertilisers were also used, but the responses from the 20 acres reverted to its very offensive smell, however, it was not popular with those who had to apply it, and it was discontinued in favour of 44/46 superphosphate. For a number of years before this the flats had a very high pH and so lighter dressings were recommended.

During the early years of the second phase all of the manuka country was gradually brought into production. The manuka had been estimated to cover some 80 acres on the farm, and as it was not possible by replacing the team with a tractor. All the tractor work could be completed in two months, which meant that a man was available for other work for the remainder of the year. On a portior of this area 3 lb. of subterranean clover was added to the mixture. On the whole ploughed area a dressing of 2 cwt. of superphosphate was broadcast with the sward. The 30 acres brought in at this time only 50 acres have reverted to second growth and efforts are being made at the moment to clear it again.
than in the previous period. The ewe numbers increased from 2000 to 2001 and the number of dry sheep correspondingly rose from 1000 to 1200. The most noticeable increase was in the cattle numbers. Breeding cows were dispersed with and up to 24 or 35 years old. During the third phase, however, the number of cattle decreased from 260 to 26. Lambing survival increased from 90 to 100 per cent, and the wool weights rose from 8½ to over 9½.

The beginning of the war marked the end of the second phase. Lime and superphosphate shortages made Mr. Gardiner decide to sell the tractor and contractors were then employed to carry out such topdressing as was possible under rationing. As a result of this one stretch of country that was traversed by motor truck was topdressed. Except in 1939, when 1000 tons of lime were applied, the only topdressing done on the property during the early years of the war was the annual application of 20 tons of superphosphate allowed as the owner's ration. This was in some measure a depressing effect on pasture production and ewe numbers were reduced by about 1000 acres. However, by the end of the war, however, 2000 tons of lime and 45 tons of superphosphate have been applied. Last year a rotary topdresser was purchased and this has proved a great success on this property, as the area could be topdressed in an endeavour to improve the quality of the native cover. Pasture production and experience convinced Mr. Gardiner that adult cattle were of immense value in promoting vigorous rejuvenation of tussock swards. In March of this year all the sheep were sold, off the block and, by buying cattle when they were available, Mr. Gardiner was able to give the sides of steep gullies a partial dressing of lime and superphosphate by running the machine along the edge of the gully. During this period that was traversed by motor truck was topdressed. Except in 1939, when 1000 tons of lime were applied, the only topdressing done on the property during the early years of the war was the annual application of 20 tons of superphosphate allowed as the owner's ration. This was in some measure a depressing effect on pasture production and ewe numbers were reduced by about 1000 acres. However, by the end of the war, however, 2000 tons of lime and 45 tons of superphosphate have been applied. Last year a rotary topdresser was purchased and this has proved a great success on this property, as the area could be topdressed in an endeavour to improve the quality of the native cover. Pasture production and experience convinced Mr. Gardiner that adult cattle were of immense value in promoting vigorous rejuvenation of tussock swards. In March of this year all the sheep were sold, off the block and, by buying cattle when they were available, Mr. Gardiner was able to give the sides of steep gullies a partial dressing of lime and superphosphate by running the machine along the edge of the gully.

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started this autumn. Influenced again by the writings and opinions of Edward Faulkner, Mr. Gardiner proposes to resow some rather poor country by an adoption of "Ploughman's" technique. By using bush and bog harrows Mr. Gardiner hopes to form a mulch of semi-rotted vegetation which he values as a mulch of pedigreed grasses. The mixture per acre will include 8 lb. of cocksfoot, 2 lb. or more of subterranean clover, 1 bushel of perennial ryegrass, strawberry clover (which incidentally does exceedingly well on some of this country), Montgomery red clover, and perhaps some crested dogstail.

Shelter is also to be improved by the planting of well-placed shelter belts and the replanning of existing subdivision.

During recent years about four miles of internal roads were constructed to enable lime to be carted on trucks to nearly all parts of the property. Annual maintenance cost has been very low, as a few hours' work with a bulldozer or a light grader is all that has been required.

One of the greatest tasks of the future is the continued control of nassella tussock. For some years nassella has caused Mr. Gardiner considerable worry. North-westerly winds have carried large quantities of nassella seed on to parts of "Vulcan Downs," but painstaking labour has prevented the establishment of this pest. About the end of November all the available labour is concentrated on the critical area and all the young plants are grubbed. This task takes many hours, but control is effected and at the present time there are very few mature plants on the property; in fact nothing but a few seedlings were observed during a recent inspection.

Two years ago an interesting and apparently successful experiment was carried out on a patch of rushes. About 7 acres of heavily-infested flats were cleared about 20 years ago and although the pasture was good for the first few years and received a liberal dressing of lime and fertilizer, the rushes gradually became dominant again. Two years ago the rushes were mown with a tractor and scrubber, and a 90 per cent. clearance effected. One further cutting will probably eliminate the rushes. Altogether 1 ton of lime and 250 lb. of superphosphate per acre have been applied each year since cutting and the award is now thick and healthy again. The rushes were at no time left as a roset on the surface, and though there was a big bulk of material, it proved in no way detrimental to the re-establishment of the grasses and clovers.

The account of the development of "Vulcan Downs" must of necessity be a rather mechanical description of systematic progress over the years. Words are somewhat inadequate to describe the immense amount of physical effort required to make this development possible. No one man, no matter how enthusiastic, could hope to achieve full success; and Mr. Gardiner would like to pay tribute to those men who worked with him and whose keenness and efforts helped to make "Vulcan Downs" what it is today. He would also like to thank the staffs of the Department of Agriculture and Canterbury Agricultural College, Lincoln, for the interest they have shown and the advice they have given.

The key to success cannot be attributed to any one factor, but several features of management stand out. Probably, one of the most important was the fact that not one cash crop was grown on the 29 years under review. Another outstanding feature is the high ratio of cattle to sheep that has been maintained for many years. Just how great a part cattle have played can never be assessed, nor can the exact value of the use of lime and superphosphate. Pasture harrowing has been practised for many years, but was discontinued during the war period after the tractor was sold. Last year, however, a set of heavy grass harrows was bought and is to be used again extensively to assist pasture rejuvenation. Heavy harrowing has proved very valuable in the past in reducing the vigour of Yorkshire fog.

This is the history, briefly if somewhat inadequately told as regards its early days, of a property which was not been exploited at any period by those connected with it but rather treated in some degree as a heritage. It can at least be said of Mr. Gardiner and of those who have worked for or with him that they have served the land faithfully with initiative, vision, and industry for observation, and lastly but by no means least by sheer hard work.