

REHABILITATION OF DETERIORATED LAND

IN THE WAIKATO.

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This is the most serious problem facing the whole of New Zealand, a much more difficult task than the handling of virgin land, as practically all this class of country is heavily infested with weeds, particularly gorse, blackberry and ragwort, Ragwort is the worst since it is injurious to stock, This land is also nearly all broken country difficult and expensive to handle, all materials and labour being high in price and difficult to procure.

There are four main points to observe in this problem viz: Grassing, stock, fencing and manure., Perhaps I can do best by giving a resume of the work of the Waikato Land Settlement Society with whom I have been connected for nearly five years,

We had approximately 8,000 acres of very badly weed infested country in three Blocks, each Block being of a different class of country.

The Whatawhata Block comprises some very heavy flats and low hills with a heavy clay sub-soil, the whole being covered with gorse, blackberry and scrub with a fair amount of ragwort on the heavy flats., This Block had all been in grass and fenced and one of our biggest jobs. was pulling down these fences which were rusted and covered in blackberry and gorse,

The Kairangi Block comprised rolling to steep land of good quality all being reverted to scrub and fern and completely infested with with. ragwort, This Block had also been well farmed at one time.

The Wharepapa Block is easy rolling lighter soil broken up by rocky gullies and badly infested with ragwort, On all the properties there were small areas of grass nearly smothered with ragwort. These were heavily topdressed and stocked and have been brought to a very high state of production. A large amount of sodium and lime have been used on these areas with apparent success but immediately we stopped stocking heavily with sheep the ragwort has grown. It would have been a much better policy to have ploughed these areas, but we required the grass for our horses and the cows for the prospective Settlers,

We have found that the plough is the best method of dealing with all weeds, By ploughing in winter and early spring and a thorough system of cultivation during the summer, the gorse and ragwort were almost completely eradicated and we have had no further trouble with land so treated.

(The method.,)

The method employed was to plough early, preferably with the disc plough, as deeply as possible on the heavy land, leave it in the rough for some time -- about two months if possible, then work it down with the discs and leveller to as even a surface as possible, Now give it two strokes with the tine harrows about once a fortnight until seeding time in the Autumn, By, this means we made all the seed germinate and then killed them, I cannot too strongly condemn the use of the discs or plough after the end of November as there is not time to make the seeds germinate and be destroyed before sowing,

On heavy land full of clods we found that a heavy rolling in January had a wonderful effect in breaking these clods which were full of seed and in bringing the moisture up to the surface thus making the seeds germinate, some places not so treated, the gorse grew after the grass was sown and when the rain came in the Autumn,

All our grass was sown in the Autumn for several reasons. On badly weed infested land there must be a thorough summer fallow and the grass seed has a perfect seed bed through the fine tilth and the accumulated moisture brought about by the summer fallow, The weeds seeds will only germinate at their own time,

On the hilly fern and scrub country not infested with gorse we have been very successful by burning, surface sowing and topdressing in the Autumn, This is a very cheap way and to-day the pasture so sown is fully as good as where the plough was used,

On the Wharepapa Block which is fairly light land our method has been to surface sow in permanent grass any land which is too difficult to work with horses or tractor but any comparatively easy land has been sown in temporary grass with a view to breaking it up for turnips in a year or two.

Our permanent grass seed mixture has been $1\frac{1}{4}$ Bushels of Certified Rye Perennial, 6 lbs. Cocksfoot, 1 lb. Crested Dogstail, 4 lbs. Cowgrass, 2 lbs White Clover, 1 lb. Alsike and in some cases 4 lbs. Paspalum.

Where we have been able to use the drill for sowing, about 35 lbs. per acre of this mixture has been used but as most of our sowing is done by hand about 42 lbs. per acre has been sown so as to make sure of a good covering, Wherever possible the ground has been rolled before and after seeding and in this connection we have proved conclusively that our best strike of grass has been where the roller was used after sowing without any covering by harrows. By this method none of the seed is dragged into the hoof marks or wheel tracks and if the ground was dry as it should be the seed has sufficient covering. I consider that more seed is lost by being buried too deeply than by insufficient covering. On soft hillsides good results have been obtained by driving a mob of sheep round before and after sowing. On a large heavy fern burn I tried line harrowing before and after sowing but could see no benefit over just sowing straight on the ash.,

When sowing grass seed we have made a practice of sowing 3 cwt. super and 3 cwt. Carbonate of Lime per acre with the seed.

(On some occasions, . . .)

On some occasions owing to late delivery of manure we have sown grass with it but the results have been disastrous. Even if applied after the grass was growing the grass did not make the same growth and it would be well into the Spring before it caught up with the other.

Occasionally we have sown super without lime and although the grass grew the same in the Winter there was a marked difference in colour in the Spring and following Summer. The most outstanding result I have seen was at Whatawhata where we applied 1 cwt. of finely ground bonedust per acre on a portion of a large Block. The difference in colour and growth could be seen a week or 'so' after the grass came up.

In the development of this class of country the stocking plays a most important part, for without a thorough system of stocking this land would soon revert to a worse state than ever, especially where gorse and ragwort are bad. Unless we are prepared to look on stock as part of our development costs we are courting disaster. While we all like to make a profit on our stock we often do so at the expense of our land and I think that this has been the downfall of a number of men who have attempted to bring in reverted second class country, On this class of land stock properly managed is the cheapest form of labour that we can procure as it serves the dual purpose of consolidating the land and keeping down the weeds.

To get the best out of our stock both from an immediate economic point of view and for doing the best work we must -make provision for wintering them, This is becoming more difficult every year **on** account of the difficulty and uncertainties of our most essential crop, the swede. Fortunately this crop does well on reverted pasture land, even badly infested with ragwort. The white butterfly plays havoc with the crop and I think it advisable to sow a certain amount of chou mollier with the swedes as the butterfly seems to have a preference for it and this gives the swedes a better chance, Moreover the chou mollier will recover from the butterfly attack,

To get the best results from swedes as much hay as possible should be saved. prior to the days of topdressing it was considered a bad practice to cut hay from comparatively new pasture but nowadays while not to be recommended the benefits from a good supply of hay justify cutting these new pastures and they can be brought back by an extra application of artificial manure, especially blood and bone,,

The swede crop serves a dual purpose. We can avoid having to sell part of our stock cheaply in the Autumn and buying dear in the Spring and the treading of stock while feeding off is a big help in consolidating the land. Also the fossicking of stock-on a run off does a great amount of good. I consider that stock do as much good work in the Winter cleaning up rubbish as they do in the Summer by controlling the pasture,

Where ragwort is bad sheep, especially hoggets, do a tremendous amount of good work by clearing up the ragwort and **not** only that but they acquire the taste and readily take to it when the growth starts in the Spring, Our experience has been that hoggets or wethers'wintered-on swedes are the best proposition for controlling ragwort.

(Adequate fencing,,,,)

Adequate fending is also very essential in the control of pasture. With comparatively small paddocks that can be cleaned up in a few days, stock can be frequently shifted on to a fresh ground and by so doing they thrive better and can stand more working. Our practice has been to put cattle ahead of the sheep,

Manure plays a most important part in this problem, especially on the lighter and hilly country. On weed infested land it is most *essential* that we have a good sole of grass as soon as possible and fairly heavy dressings of manure are necessary for the first, few years. With a good sole of grass heavily stocked and manured, the stock thrive even when on fairly short rations and they have to be kept short to control the pastures. We have found that where we have not topdressed heavily the sheep had to be practically starved to get them to control the ragwort, while on the well topdressed pastures the ragwort never gave any trouble
