



## Improvement of Tussock Grassland

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**T**HE high-country tussock grassland of Marlborough has been occupied for pastoral purposes for almost 100 years. During that time the land has been burned repeatedly, heavily stocked with sheep, and infested with rabbits. When it is considered that tussock grassland evolved in the absence of grazing animals and there has been little attempt at improvement, it is remarkable that it has continued to run sheep and produce wool. Although the more palatable grasses and herbs have been reduced in number and in part eliminated, the decline in carrying capacity has been offset by certain introduced species such as catsear, Yorkshire fog, browntop, and sweet vernal, but there has been no concerted effort at surface sowing. This article describes the methods used in surface sowing of tussock grassland with cocksfoot and the results obtained.

**C**AMDEN RUN, which occupies 20,000 acres, is favourably situated on the south side of the Awatere River valley, in Marlborough, having on the whole a northerly to north-easterly aspect. The land is undulating and is cut by three small rivers, the Hodder, Cam, and Isis. Most of the country lies between 1500ft. and 3000ft. and only the faces of the Kaikoura Mountains at the back of the run ascend to higher altitudes; consequently there is very little snow risk.

The country would be classed broadly as mixed fescue tussock and silver tussock country and consists principally of Hurunui soil types.

When the present owner, Mr. I. H. Cameron, took over the property in 1923 he had plans for sowing cocksfoot

to improve the native grassland. There had been successful establishment of cocksfoot on tussock country on Banks Peninsula and other areas and on his own run patches which had been sown some years previously were still thriving, and even on dry, wind-swept knobs plants survived in spite of heavy grazing by sheep and rabbits, all of which indicated that cocksfoot would establish.

It was realised that the successful establishment of any grass and more especially cocksfoot would involve spelling, and for the first few years old fences were removed to new sites and new ones erected to subdivide the run into blocks of convenient size. During this period small trials were sown with cocksfoot and protected by wire netting, and in swampy places and in stream beds seed was scattered

among the rank vegetation. Cocksfoot established well and has since spread through the neighbouring swampy areas wherever moisture and tall vegetation have protected the seedling plants from grazing and aided establishment.

The success of these early trial sowings was encouraging, and having completed the necessary fencing, Mr. Cameron considered surface sowing. Seed had to be purchased because, although an area of some 30 to 40 acres had been ploughed and sown with cocksfoot with the aim of harvesting a seed crop, it was found that in most years seed would not fill because of summer droughts.

### Method of Preparation for Sowing

Most of the effective rainfall occurs in early spring when frosts are still prevalent. When frosts have ceased hot winds dry out the country rapidly and the establishment of seedlings is unreliable. It was considered that by burning, the shading influence of the tussocks and tauhinu scrub would be removed, the ground surface would be opened to the sun, and the ground temperature would rise earlier in the spring so that seed could germinate and plants establish earlier and be able to utilise the available moisture before the dry conditions of summer.

The country was burnt in early August while the bases of the tussocks and dead matter surrounding them were wet. By waiting for suitable conditions it was found that the tops of tussocks could be burnt, leaving a

**HEADING PHOTOGRAPH:** View showing topography of the country sown. In the background is the inland Kaikoura Range.