

One of the outstanding difficulties of the introduction of grasses and clovers on to second-growth country is the fact that all the kinds of any value are exceedingly high in price, and if any heavy seeding is carried out the cost would be excessive. The present experimental areas in the Whangamomona district are of very great value in this direction, and present indications are that brown-top can be established easily, rapidly, and with quite a light seeding.

The following are the approximate prices per pound of grasses and clovers likely to prove valuable: Brown-top (say), 3s.; *danthonia pilosa* (say), 2s.; *danthonia semiannularis*, 2s.; crested dogtail (say), 1s.; *paspalum* (say), 1s. 6d.; *poa pratensis* (say), 1s. 6d.; ratstail (say), 2s. 6d.; lotus major, 3s. 6d.; subterranean clover, 6s.

The question of a cheapening of these seeds is a matter of great importance, and the matter of financial assistance by the Government in enabling a combination of farmers to grow their own requirements should be considered. I do not mean the growing of the seed in the districts themselves, but the actual having of a seed-growing farm, say for brown-top, in whatever district is most suitable; financial assistance to secure supplies of *danthonia*-seed, and the like. A careful study of the present experiments in operation should prove most valuable in working out what mixtures are best, and a considerable extension of the work in progress should be undertaken.

(3.) *Phosphatic top-dressing of second-growth grassland.*

The wonderful results that have followed the top-dressing of worn-out grassland in many parts of New Zealand have led to the general idea that in top-dressing lies the salvation of the second-growth grasslands of the North. There is no doubt that top-dressing, rationally carried out, will prove of great value, but just how, when, and where top-dressing should be done is hard to answer satisfactorily. Top-dressing of weak grassland and of any portions that are moderately well grassed appears to me to be sound under nearly all circumstances. Top-dressing will increase the feed produced and thereby increase the stock carried, and increase in stock-carrying capacity is perhaps the most potent factor of all in the control of second growth. There are, however, certain points that have to be considered. Firstly, the amount of material necessary may have to be fairly large, and repetition of application necessary before any decided advantage is secured—this means that top-dressing will be expensive; secondly, the most striking immediate results will be secured from the better-grassed areas. As these areas will mainly be on the flats and lower slopes, top-dressing them will tend to keep stock only on the top-dressed areas, and unless fenced off the tendency will be for stock not to penetrate at all the higher slopes, and second growth may in this way be increased rather than diminished. This is perhaps a more important point that is generally considered. The cost of hand distribution of artificial manure need not be considered, as the ordinary labourer of the farm can in all cases do all that is necessary. In point of fact, methods whereby the actual manual work of the owner can be devoted to the control of second-growth suppression have not as yet been given the attention they deserve. It will be noted that the three great generally-suggested methods of control—namely, increasing cattle, the sowing of low-fertility-demanding grasses, and top-dressing—are all expensive and require considerable capital, whereas the one method of management that does not in many cases require any additional capital—namely, actual mechanical control by hand labour—has as yet not been vigorously applied. It is remarkable that on many holdings considerable manual work is willingly undertaken against vegetation that is of no moment whatever, particularly against foxgloves, whereas against the really serious invaders the farmer is content to put forward suggestions of getting something else to do the work for him—namely, cattle, grass-seed, and artificial manure. I have mentioned with regard to cattle the necessity for extended scientific investigation, and the same holds true with regard to resowing, top-dressing, and manual treatment. The work should not be carried out on any one special experimental farm, but adequate funds should be available to put under trial conditions on many farms all possible methods of management. In addition to the actual money required for cattle, fencing, seed, and manures, expert scientific supervision is necessary, and extra assistance should be provided for Mr. Levy. I would also suggest that a very complete study of the economics of hill-country grassland farming should be carried on simultaneously with any experimental work undertaken, and for this purpose the formation of a small branch of the Fields Division should be formed devoted to the study of agricultural economic problems, amongst which, to begin with the question of the economics of second-growth country should be carefully studied.

(4.) *What should be done to relieve the present unsatisfactory condition of many holdings.*

In the foregoing I have indicated the four great methods of secondary-growth suppression that have been suggested—cattle, resowing with low-fertility-demanding grasses, top-dressing, and direct manual labour. With regard to the efficacy of these methods, under what conditions they should be put into operation, their costs and probable returns, very little of any definite value is known, and accordingly the foundation of a policy of assistance is sadly handicapped. Why have the holdings gone back? is the question that requires answering, and probably in ninety-nine cases out of a hundred the holder will say, "Through lack of sufficient capital to adequately work the holding." Just what capital is required to keep such grassland in good order? Does it vary per acre according to whether the holding is a small or large one? Would in many cases the money required be greater than any ultimate value of the land? Personally I consider that the country has gone back on account of several reasons. Firstly, the original sowings, being mainly rye/cockfoot, were quite unsuitable for any but the flat land and more fertile portions of the lower slopes; secondly, it was not recognized that the cost of maintaining such country in grass was much higher than currently supposed. The