

results from surface-sowing in many localities, and considering that the conditions for plant-life and seed-germination of many slopes up to 3,000 ft.—or, indeed, 4,000 ft.—altitude are not very different from what they are at lower levels, it is reasonable to expect satisfactory results from the surface-sowing of such country. Also, there is the important fact that the sheep themselves, and other distributing factors, have led to the permanent settlement up to high altitudes of certain palatable plants such as Yorkshire fog (*Holcus lanatus*), fiorin (*Agrostis alba*), meadow-grass (*Poa pratensis*), and catsear (*Hypochoeris radicata*), to cite some of the more important. Now, what nature is doing unaided should surely be better carried out by the skill of man.

From the last paragraph it seems clear that a good case has been made out for the improvement of pasture by means of surface-sowing. How, then, should this be carried out? Now, as already explained, the mountain grasslands vary greatly in their composition. Generally, however, there is dominance of one or other of the tussocks, which, in order that they shall yield palatable food, and also in order to hinder them choking out better plants, must be burned. This burning of the tussock produces in the resulting ashes a seed-bed which otherwise is absent. Surface-sowing the tussock country after burning is then indicated; and if sheep could be driven over the ground after sowing in order to trample in the seed, so much the better. Unfortunately, this sowing after burning must be carried out in spring, a season probably not so favourable as the autumn—the natural seeding-time for most plants.

It has been pointed out that sheep themselves function to no small extent in distributing and sowing seeds. In autumn and late summer, when the pasture plants are in seed, mobs of sheep grazing on a part of a run where seeds are plentiful might with advantage be driven on to other parts of the run in order to carry on surface-sowing on their own account. The great spread of danthonia (*Danthonia pilosa*) in Marlborough is probably due in no small degree to the action of the sheep. Favourable and unfavourable opinions as to the method suggested above will occur to all practical sheep-farmers.

Surface-sowing, as suggested in the last two paragraphs, can only be carried out on land where there is sufficient tussock. Regrassing the depleted areas is another matter. In Central Otago on the hill-faces the original vegetation, as explained already, is altogether gone, and the ground is virtually bare. This bare ground varies in character from that where there is abundant and excellent mica-schist soil, covered probably with many scabweeds, to that where the underlying rock and stony debris is exposed—the case generally on extremely exposed ridges. An important distinction occurs between shady and sunny slopes—the former obviously the most suitable for regrassing. Then there are the gullies, where, even yet, in many places there is much valuable herbage.

At the present time the Department of Agriculture is carrying out a series of experiments in order to ascertain, first of all, if regrassing the extremely denuded country, at from 1,000 ft. to 2,000 ft. altitude, is possible, and, if so, to find out the best and cheapest methods for so doing. These experimental plots, as explained in the introduction to this report, we visited. We found the experiments designed with scrupulous care, and to us they seemed planned in the right direction. Until these experiments produce positive or negative results it seems to us premature to offer definite suggestions regarding regrassing the completely denuded areas. But the matter of their improvement receives further consideration under the next head.

As for the grasses and other plants to be used for surface-sowing, and having regard to recent work on palatability carried out by the Department of Agriculture, we consider the following to be the most suitable: Meadow-grass (*Poa pratensis*), cocksfoot (*Dactylis glomerata*), catsear (*Hypochoeris radicata*), white clover (*Trifolium repens*), suckling clover (*R. dubium*), fiorin (*Agrostis alba*), red-top (*A. vulgaris*), danthonia (*Danthonia pilosa*), Yorkshire fog (*Holcus lanatus*), Chewing's fescue (*Festuca rubra* var.), and possibly blue-grass (*Agropyron scabrum*), but the seed of this is not yet to be procured commercially. To the above might be added lucerne (*Medicago sativa*) and yarrow (*Achillea millefolium*).