

As an initial lime dressing for soils that have never been limed or that have not been dressed for some years, however, 1 to 2 tons per acre of burnt lime (according to the extent to which the soil is supplied with organic matter and to the sourness displayed), or its approximate calcium-carbonate equivalent, 2 to 4 tons per acre of ground limestone, are usually applied to soils in general. Nevertheless, obtaining the lime-requirement, either by soil-analysis or by carefully conducted plot experiments, is the only accurate means of guiding the farmer in the matter of liming, not only as regards the initial supply required for a particular type of land, but also as regards the quantity required annually to maintain the supply under a definite system of rotation farming adopted. In the absence of this knowledge—and the requirement will vary with type of soil, climate, and system of farming—advice as to maintaining the lime-supply of soils in general, after initial liming has been attended to, can only be given in the nature of supplying ground limestone in small quantity (2 cwt. to 5 cwt. per acre) with the manures when used for manuring the turnip or other crop with which fertilizer is supplied. Carbonate of lime is fairly suitable for mixing with manures, especially those containing nitrogen among their constituent parts. Failing this convenient method of keeping up the lime-supply, the system of applying a definite quantity every five or six years—as, for instance, the quantities previously mentioned for soils in general—will require to be resorted to. This latter method is not an economical one for soils inclined to be porous, from which soils lime is leached considerably by a copious rainfall. For stiffish retentive soils it is, however, adaptive. But, as indicated, the ascertaining of the annual lime-requirement for definite types of soil, climate, and systems of rotation farming, by soil-analysis or by plot experiment, or by the two combined, is the only reliable guide in this question of liming.

Apart from these considerations, however, there exists the known fact that lime is required by New Zealand soils, and any legitimate means that can meantime be adopted for encouraging its universal use is justifiable, for there can be no doubt but that lime, used extensively and judiciously, will enormously increase the production of the country.

#### SOIL-RENOVATION AND MAINTENANCE OF FERTILITY.

Throughout the sections of the Dominion where cereal cropping has been practised persistently for a number of years, and in soils of the lighter nature, humus is required. Exhausting the virgin fertility, mainly through depletion of humus by continuous cropping, cannot always prevail if a soil is to remain productive. Commercial fertilizers are being used in large quantities throughout the country, and lime is being applied more generally than formerly; but what steps, if any, are being taken to systematically replenish the humus-supply of our soils, particularly of the soils above mentioned? To my knowledge, practically no farm system of regular humus-supply has as yet been taken up seriously, and in the cropping districts it is time that some consideration was given to this important matter. Traversing the older cereal-growing districts of the Dominion, it is evident, by the appearance of the soil in many instances, that humus is badly needed to restore the fertility of these areas. Lime and commercial fertilizers alone will not restore this fertility, however intelligently they are used.