On cold clay soils we frequently find the better grasses and clovers giving place to the inferior bent grasses, such as fiorin and red-top. As already indicated, these latter grasses like sour soils, and lime is required to encourage the superior vegetation. Foot-hill lands and lands at the base of hills are frequently sour, the characteristic vegetation being the bent grasses. Here liming is badly required, but drainage has frequently to be attended to first. There are in New Zealand thousands of acres of sour soils, for the most part clays or clay loams, of this class that specially require lime.

When a soil is sour it will turn blue litmus paper placed in contact with it red. To carry out the test make a small quantity of soil into a thin mud with pure water, and after its has stood for a short time place a slip of blue litmus paper on it and cover with the mud. After about ten minutes remove the paper, washing it, if necessary, in pure water to show the colour. If the paper has turned red the soil is sour and needs an application of lime to sweeten it. The litmus-paper test can also be made by inserting a slip of the blue paper into an incision made in the soil (stripped of its surface vegetation) with a knife and by pressing the soil firmly on either side of the paper. Practically all chemists keep litmus, which can be purchased very cheaply.

From the chemical standpoint—according to Dr. A. D. Hall—any soil that contains less than 1 per cent. of carbonate of lime can be improved by liming, and any soil containing less than 0·2 per cent. of lime carbonate cannot make proper use of fertilizers applied thereto.

Soils that are refractory or stiff and hard to work, as, for instance, most clay soils; drained swamp soils; light open soils; soils that have been cleared of fern or manuka; soils affected with club-root of turnips; soils which do not grow clovers well; soils well supplied with the acid-loving plants enumerated above; and soils upon which superphosphate has been used for years—these are in greatest need of lime.

FORMS OF LIME TO USE.

The forms of lime commonly used in agricultural practice are burnt lime and carbonate of lime (ground limestone). The former should only be used in quantity (heavy or moderately heavy dressings) on soils well supplied with humus as indicated by good dark colour to a fair depth. It has the tendency to burn out (oxidize) the humus, and for this reason is inclined to be exhaustive, particularly on light lands not very well supplied with organic