



## Pasture Topdressing in North Island

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It is always difficult to say exactly what fertiliser and how much fertiliser and lime should be applied to a given field. This complexity arises because there are many factors to consider—economics, management, past topdressing history, and soil type. The influence of soil type in fertiliser requirements may be very distinct. In this the first of a series of articles fertiliser, lime, and trace element requirements of pastures are discussed in terms of important soil groups. These soil groups comprise related soils occurring under similar climatic and topographical conditions and follow the genetic classification adopted by the Soil Bureau, Department of Scientific and Industrial Research (1). In the next article of the series the mineral requirements of airborne volcanic ash soils will be discussed.

THE Soil Bureau distinguishes soils by their parent material and the development they have undergone since changing from parent rock to the present soil supporting pasture, scrub, or forest.

This article is limited to describing soils of the North Island formed on sedimentary rocks. These are rocks derived from material such as sand, silt, and fine clay deposited by rivers in ancient seas and later raised by earth movements to form the present outline of New Zealand. Limestone is also a sedimentary rock.

The soils derived from sedimentary rock and coastal sands vary greatly in

natural mineral fertility. Even the poorest soils, however, can be brought to a high level of mineral fertility by the application of a few simple chemical compounds. These are phosphatic fertilisers, potassic fertilisers, ground limestone, and perhaps molyb-

denum and copper salts. On very limited areas zinc, magnesium sulphate, and boron may further raise fertility.

HEADING PHOTOGRAPH: Fairly steep hill soils formed from mudstone (yellow-brown earths, moderately weathered) in the Wairarapa. This is good store sheep country, particularly if it is topdressed with  $1\frac{1}{2}$ cwt. to 2cwt. of superphosphate per acre every 2 to 3 years. Department of Scientific and Industrial Research photo.

In the North Island nearly all soils derived from sedimentary rock need phosphatic fertilisers. The rate at which these should be applied depends less on the natural fertility of the soil than on the kind of pasture it will grow and its capacity to fix applied phosphate in a form unavailable to plants. Soils on which subtropical clover or *Lotus uliginosus* (major) would be the main legume in the pasture would need less phosphate than soils on which good white clover pastures are desired. Soils receiving a high average rainfall usually need more phosphate to keep pasture from reverting to scrub and weeds than soils in the dry districts of, for instance, central Hawke's Bay.

Little is known about the extent to which phosphate is fixed in an unavailable form on soils derived from sedimentary rocks. Only a few years ago failure of water soluble phosphates to stimulate pastures was attributed to phosphate fixation; today there is some evidence that this may be due to trace element deficiencies.