

amounts of limestone the quantity of phosphate yearly required will be much lessened, as the lime hinders or prevents the change from taking place in the phosphates. In this connection, when time permits, it is intended to take up the study of the soil in the individual paddocks at the State farms to ascertain whether land which has been highly manured with phosphates in the past, and which still responds to phosphates, cannot have the dormant phosphoric acid awakened by the application of suitable lime dressings.

No further shipments of Ephos phosphate or basic slag have arrived during the year.

The possibilities of the guano deposit on Green Island, Dunedin, have been considered. This phosphate contains 20 per cent. of phosphoric acid, combined with lime, alumina, and iron; but the difficulties of transporting supplies from the island are great, and the fact that the phosphoric acid is in combination with iron and alumina considerably discounts the possibilities of its success as a soil-dressing. The question of securing from other islands phosphate having a similar high percentage of iron and aluminium phosphate was considered, but no recommendation could be made.

Several phosphatic fertilizers (K/360/3) manufactured from fish-refuse were analysed for the Chief Inspector of Fisheries. The best of these only contained 5.5 per cent. nitrogen and 10.6 per cent. phosphoric acid, while others contained less than one-half of these constituents. The hope of manufacturing a useful phosphatic fertilizer from fish-scrap should certainly be encouraged, although any fertilizer from fish-scrap is liable to be rather overburdened with nitrogen.

#### POTASH.

A good deal of attention has been devoted to the saving of wood-ashes at sawmills with the view to their subsequent utilization as a source of potash by either fertilizer-mixers or farmers. This and other attempts to bring the producers of waste products containing potash into touch with those requiring potash met with very feeble support from the former. Several truckloads of wood-ashes have been sold, but the chemical composition of the ash did not come up to expectations based on the analysis of samples upon which the ashes were bought.

The importance of utilizing by-products of the timber industry is not generally realized. In the case of wood-ashes it is likely that the value will sink as soon as more concentrated salts of potash, owing to cessation of war, become available. If the waste from phormium-mills is ever utilized one of the by-products will probably be an ash high in potash, which will be available for mixing with fertilizers, especially superphosphate. The possibility of making a commercial potash fertilizer from New Zealand seaweed is too remote to warrant entertaining it. A sample of potash stated to be manufactured from New Zealand kelp was forwarded by the Marine Department (K/172), but was found to contain only 5.41 per cent. of potash ( $K_2O$ ) soluble in water.

Potassium nitrate (nitre) from India was considered as a source of the small amount of potash required for New Zealand, but the export was not permitted by the Imperial authorities.

Samples of wool-refuse analysed contained (K/151) 1.4 per cent. and (K/178) 3.44 per cent. of potash. Another sample of a fertilizer (K/585-6) produced by the treatment of daggy wool contained 3.3 to 3.5 per cent. nitrogen, 4 to 4.5 per cent. potash, and 1.45 per cent. phosphoric acid, and would be a useful fertilizer for market-gardeners, but the nitrogen, being present largely in the form of small wool-fibres, is in a very unavailable condition.

As potash is recovered from the flue-dusts of cement-factories in America, all the Portland cement companies in New Zealand were circularized in April, 1918, and the matter explained and offers made to analyse samples of the dusts. The replies of the companies indicated that although some of them had considered the matter, the prospective saving was not sufficiently attractive to warrant any works installing potash-recovery plants. The fourth article on "Potash in Agriculture" was published in the *Journal* for May, 1918.

#### FERTILIZER IMPORTATION.

The publication of the returns from the Customs Department has been continued in the *Journal*, with the innovation that they have been published quarterly instead of annually. An article dealing with the year's returns was published in the July, 1918, *Journal*.

#### FERTILIZERS ANALYSED UNDER THE FERTILIZERS ACT.

Sixteen samples of commercial fertilizers were analysed for Inspectors under the Act, compared with twenty-one analysed during the previous year. It has now been arranged that special officers shall be utilized for the sampling of fertilizers under the Act, as it is work that should only be entrusted to those specially fitted therefor.

#### DEFICIENCY DISEASES IN STOCK.

Further reports from farmers have been received as to this class of disease in stock. At Kaitoke, on a farm lying on the slopes of the Rimutaka Range, it is reported that neither calves nor lambs can be reared on certain portions of the property. An extraordinary statement of the owner is that basic slag at the rate of 3 cwt. per acre makes no difference in the appearance of the herbage. The soils (J/322-3) have been analysed, and are silty soils, but while there was no outstanding deficiency of nitrogen, phosphoric acid, or potash, there was a decided deficiency of lime, the Hutchinson-MacLennan method showing that nearly 5 tons of carbonate of lime are required per acre. The lime-magnesia ratio of the hydrochloric-acid extract is unbalanced, a peculiarity I have noticed in other soils in which deficiency diseases develop in the vicinity of the Wairarapa Valley (see *Journal*, 15th November, 1910, page 222). A well-known Masterton runholder reports that there is a belt of poor country, which naturally grows nothing but scrub, running right through the range to the eastward and roughly parallel to the Wairarapa Valley.