

The following chemical data for a typical pakihi profile on the Buller Gorge Road illustrate the characteristics of these podsols :—

Depth in Profile. (Inches).	Horizon.	Available Phosphoric Acid.	Base Exchange Capacity.	Total Exchange- able Basis.	Base Saturation.	pH.	Iron Oxide.	Loss on Ignition.
		Per Cent.	m.e.	m.e.	Per Cent.		Per Cent.	Per Cent.
0-1½	A ₀	..	16.7	1.5	9.0	4.6	..	12.79
1½-6½	A ₁	0.002	11.7	0.4	3.4	4.7	Trace	7.85
6½-18½	A ₂	0.006	11.3	0.2	1.8	5.0	1.44	4.71
18½-34½	A ₃	0.007	5.4	0.2	3.7	5.0	0.95	2.30
34½-38½	B ₁	0.008	30.3	0.1	0.3	5.0	3.90	14.91
38½-45½	B ₂	0.003	10.3	0	0	5.1	9.65	6.05
45½+	C	0.025	2.2	0	0	5.2	2.90	1.74

Under the high rainfall of the West Coast leaching proceeds very rapidly, and open-textured soils in particular quickly develop the characteristics of typical podsols. The consolidated sands adjoining the sea-beach in the Sergeant's Hill locality, despite their very recent origin, already show great exhaustion of bases and phosphate, with pan formation in the B horizon.

The alluvial soils of the Buller and Orowaiti river systems, on the other hand, are well supplied with available phosphate. These soils are acid, with pH values ranging from 4.8 to 5.5. On the more recent flats there is no indication of iron-movement and pan formation.

An interesting feature of the pakihi lands is the occurrence of cobalt-deficiency among calves when grazed on pastures established on these soils. The cobalt content of the soil is less than 0.5 p.p.m. During the past season the use of cobalt drenches and cobalt licks has given great benefit to stock grazing the development area of the Lands Department.

SOILS OF THE BANKS PENINSULA.

A series of soil samples was received from the pedologist in charge of the survey in Banks Peninsula, and the samples have been examined in the laboratory for texture, plant-food, and base status. The data show that the soils of all types are acid and unsaturated in regard to bases. Soils which have been associated with forest cover have a much higher base status than those associated with tea-tree. Some of the best soils have a base saturation of 36.5 per cent., against 15 per cent. for the poor types.

The data for plant-food status reveal wide and irregular differences in both available phosphate and potash. The brown loams of basaltic origin have high phosphate figures in contrast to the tea-tree soils of loess derivation which have a very low phosphate status. The infertility of the latter soils appears to be connected with low base and phosphate status.

TOBACCO SOILS.

It has been long suspected that irregular growth of tobacco seedlings in the beds of Nelson growers has been influenced in certain cases by the manurial treatment of the soils. The use of lime, wood-ash, and fertilizers in excessive amounts has been noted on different occasions by officers of the Cawthron Institute, and has been associated with poor growth of tobacco seedlings.

At the request of the tobacco Research Committee, and in co-operation with Mr. J. M. Allan, Tobacco Research Officer, soil samples from a series of seedling beds in different parts of the Nelson district were examined with a view to securing more definite information concerning the manurial practice adopted by growers in the treatment of seedling beds.

Determinations of available plant-food and pH were made on a set of fifty-five samples collected by the Tobacco Research Officer. The analytical results show that there are great variations in the plant-food supply and in the reaction of the seedling beds. The range of pH values in the top 0-3 in. of soil was 5.8 to 8.2, with an average value for fifty-five soil samples of 6.4. Twelve samples of soil had values of 7.0 or greater. As tobacco is considered to grow best under acid-soil conditions, these high pH values suggest that actual harm to seedlings may result from excessive applications of wood-ash and lime.

The percentage of available potash in the soils varied from 0.009-0.074, with an average figure for forty-samples of 0.024 per cent. The analytical data indicate that in certain cases little if any potassic manures are used by growers, while in other cases the figures suggest that excessive amounts of manures are being used.

Figures for available phosphoric acid were invariably high, indicating that all tobacco-growers were using liberal amounts of phosphatic manures in the treatment of the seedling beds. The percentages ranged from 0.035 to 0.114, with an average figure for fifty soils of 0.083 per cent.

SOLUBLE SALTS IN NEW ZEALAND SOILS.

In continuation of their studies of soluble salts in New Zealand soils, Messrs. Dixon and Harris have examined soils at Wakapuaka, Nelson, and at Blenheim which have been affected by sea-water flooding. Determinations of the soluble salts in soil associated with the growth of *Salicornia*, *Juncus*, buckshorn plantain, and grasses have been made. It was found in the soils of both districts that sodium had entered the clay complex and had been retained despite great reduction in the amount of soluble salts as a result of leaching by rain.

In the case of Wakapuaka soils, high content of soluble salts detrimentally affected pasture establishment. In the Blenheim soils the presence of sodium bicarbonate adversely affected the growth of lucerne and other crops.