presented in Table I show that a considerable amount of leaching has taken place even in the youngest soils of this series.

TABLE I.—EXCHANGEABLE BASE STATUS OF TYPICAL RED-BROWN SOILS.

Locality.	Depth of Sampling.	pH Value.	Base Exchange Capacity.	Replaceable Bases.	Base Saturation.
	In.		m.e. per Cent.	m.e. per Cent.	Per Cent.
Ohaiawai	0–2	5·3	86·09	10·23	11·2
	2–8	5·3	57·44	1·12	1·9
	8–16	5·6	42·03	0·17	0·4
	16–32	5·6	57·96	0·18	0·3
Okaihau (ironstone soil) ..	0–3	5·5	31·46	1·90	6·0
	3–10	5·3	23·40	0·22	0·9
	10–17	5·3	22·70	0·10	0·5
	17–19	5·3	35·56	0	0
	19–24	5·3	34·77	0	0

Even the Ohaiawai soil, which represents the more youthful members of the red-brown series, shows a comparatively low percentage of replaceable bases and a high degree of base unsaturation.

The more mature soil from Okaihau shows these features in a more pronounced manner, the lower sections of the profile having no replaceable bases at all. The data indicate the great importance of lime treatment in rebuilding the fertility of these soils.

The Okaihau soils with their low base saturation and high iron content are characterized by a strong power of fixing soluble phosphates, and on this account special attention must be paid to the type of phosphatic fertilizer used in their treatment. Some recent overseas work indicates that "dunite," a magnesium silicate, is beneficial on such soils in maintaining the available phosphate status. Pot trials have been commenced at the Institute with a view to determining the value of powdered serpentine rock (obtained from the Mineral Belt, Nelson) in promoting high efficiency of phosphatic manures on the Okaihau soil.

In the past the presence of soluble aluminium compounds has been suspected as a cause of infertility in ironstone soils, but preliminary work at the Institute on the amount of soluble aluminium contained in the soil solution does not give any support to this suggestion.

HAWKE'S BAY SOILS.

Routine analyses have been continued on soil samples forwarded by the pedologists from different parts of Hawke's Bay. As no final classification of Hawke's Bay soils has yet been decided upon it is not possible to group the chemical data on a basis of soil types. The figures, however, show a wide variation in plant-food content and exchangeable base status and indicate clearly the necessity for the mapping and classification of the soils which is now being done by the pedologists.

In many soil samples the percentage of available phosphoric acid is less than 0·01 per cent., but rises in the fertile Pakowai soils to 0·049 per cent. Similar variations in available potash and pH values have been encountered. While 5·32 represents the lowest pH value, a figure of 8·0 was obtained for a Pakowai sample.

Hawke's Bay soils differ markedly from many North Auckland soils in base status. The percentage base saturation of Hawke's Bay soils is never very low, indicating that the leaching process has never been intense, and suggesting that excellent response from superphosphate will be obtained on many Hawke's Bay soils without resort to lime treatment.

SOILS OF THE WAIPA COUNTY.

A series of profiles representing the more important soil types in the Waipa County have been collected with a view to their chemical characterization. Special studies of base saturation are being made in order to ascertain, if possible, the degree of leaching to which each soil type has been subjected. An attempt is also being made to correlate chemical studies of soil samples taken from the field plots of the Department of Agriculture with fertilizer response.

Table II illustrates the great variation in base saturation met with on different soils of the Waipa County.

TABLE II.

Depth of Sampling.	Soil Type.	Base Saturation.
In.		Per Cent.
0–3	Hamilton clay loam	54·9
0–4	Hamilton clay	40·4
0–2	Waikato sand	28·3
0–3	Whatawhata clay loam	28·3
0–3	Ohaupo silt loam	25·5
0–6	Te Kowhai clay loam	17·6
0–4	Waihi	14·9
0–7	Horotiu sandy loam	13·7
0–5	Te Rapa peaty loam	4·9