HIGHLY CALCAREOUS LOAM

General Description: *Very highly calcareous grey loam, becoming more clayey and calcareous with depth and with significant gypsum accumulation*

Landform: Very gently undulating to level plain

Substrate: Calcareous clay of an ancient lagoon bed.

Vegetation:

Type Site: Site No.: MM155

1:50,000 sheet:	6827-3 (Moorlands)	Hundred:	Sherlock
Annual rainfall:	375 mm	Sampling date:	22/07/02
Landform:	Flat plain		
Surface:	Soft with less than 2% calcrete stones (6-20 mm) Sporadic scalding – site on edge of scald (‘magnesia patch’)		

Soil Description:

Depth (cm)	*Description*
0-11	Brown soft massive very highly calcareous loam. Clear to:
11-27	Light brown soft massive very highly calcareous loam with 2-10% soft gypsum. Clear to:
27-43	Pink soft massive very highly calcareous heavy loam with 20-50% soft gypsum. Gradual to:
43-77	Reddish yellow soft massive very highly calcareous light clay with 20-50% soft gypsum. Gradual to:
77-105	Reddish yellow and white mottled soft very highly calcareous light clay with 20-50% fine carbonate segregations.

Classification: Hypervescent, Regolithic, Hypercalcic Calcarosol; medium, non-gravelly, loamy / clayey, moderate

Summary of Properties

Drainage: Rapidly drained. The soil is unlikely to remain wet for more than a few hours following heavy or prolonged rainfall

Fertility: Inherent fertility is low despite the favourable clay and organic matter content of the surface soil. This is due to the high carbonate content throughout, tying up phosphorus, zinc, manganese and copper. Tissue testing is needed to establish deficiencies in individual crops. Note high gypsum concentrations (sulphate-sulphur and exchangeable calcium values are very high).

pH: Alkaline throughout.

Rooting depth: 77 cm in pit, but few roots below 27 cm.

Barriers to root growth:

Physical: There are no physical barriers.

Chemical: High salinity limits root growth of sensitive crops. Even barley will be significantly affected by these levels. Boron concentrations are approaching toxic from 43 cm. High carbonate content restricts nutrient uptake by roots.

Water holding capacity: 120 mm in the potential root zone, but only about 60 mm is affectively available on observed root distribution patterns. For salt sensitive plants, effectively available water is minimal.

Seedling emergence: Satisfactory.

Workability: The soft calcareous surface is easily worked.

Erosion Potential

Water: Low.

Wind: Moderately low. The surface powders when excessively cultivated or over-grazed. In this condition it is susceptible to wind erosion. Scalded patches are at constant risk.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum of cations cmol (+)/kg *	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	8.0	7.7	22	2.44	6.59	2.40	24	393	4756	5.2	0.27	2.5	1.67	0.78	54.2	48.3	2.57	2.33	0.92	4.3
0-11	8.1	7.8	23	3.73	15.69	2.24	21	391	5016	8.0	0.32	2.9	1.41	0.81	60.2	49.6	3.90	5.74	0.93	9.5
11-27	8.5	8.3	32	5.03	22.70	1.19	6	162	5514	7.6	0.09	1.4	0.81	0.21	87.1	71.1	6.33	9.32	0.32	10.7
27-43	8.5	8.2	11	3.79	12.33	0.49	7	151	6757	6.3	0.12	1.5	0.50	0.23	139.5	128	5.38	5.37	0.30	3.8
43-77	8.3	8.1	26	4.24	15.83	0.40	23	402	5768	13.2	0.15	1.5	0.54	0.21	50.8	32.0	8.97	9.04	0.75	17.8
77-105	8.5	8.1	14	2.47	16.15	0.45	11	462	1201	11.0	0.25	3.9	0.69	0.23	28.1	10.8	7.62	8.54	1.12	30.4

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit.

* Sum of cations is a measure of the soil's capacity to store and release major nutrient elements. In neutral to alkaline soils the sum is approximately equivalent to CEC (cation exchange capacity). The high exchangeable calcium (and consequently the high sum of cations value) is due to the high gypsum content of this soil. The gypsum was not removed prior to the exchangeable cation analysis.

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, which at this site is estimated from the sum of cations.