

HARD LOAMY SAND OVER DISPERSIVE RED CLAY

General Description: *Hard loamy sand over a poorly structured dispersive red clay, calcareous with depth*

Landform: Alluvial fan in an undulating landscape

Substrate: Fine grained outwash sediments (Pooraka Formation) mantled by windblown carbonate

Vegetation:



Type Site: Site No.: EE212
 1:50,000 sheet: 6230-4 (Mangalo) Hundred: Mann
 Annual rainfall: 380 mm Sampling date: 17/09/01
 Landform: Midslope of alluvial fan, 2% slope
 Surface: Hard setting with 2-10% quartz stones to 20 mm

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-10	Dark reddish brown hard loamy sand with weak granular structure. Clear to:
10-25	Dark reddish brown sandy light clay (dispersive) with weak coarse columnar breaking to subangular blocky structure. Gradual to:
25-70	Strong brown very highly calcareous sandy light clay with moderate coarse subangular blocky structure and 20-50% fine carbonate segregations. Gradual to:
70-140	Yellowish red massive very highly calcareous light clay with 20-50% fine carbonate segregations.



Classification: Hypercalcic, Hypernatric, Red Sodosol; medium, slightly gravelly, sandy / clayey, deep

Summary of Properties

Drainage: Moderately well drained. The dispersive subsoil perches water causing saturation for periods of up to a week following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. The low clay content surface soil has poor nutrient retention capacity. Organic matter can supplement this capacity, but organic carbon levels are low at this site. Concentrations of all tested elements are satisfactory.

pH: Neutral at the surface, strongly alkaline with depth.

Rooting depth: 75 cm in the pit, but few roots below 25 cm.

Barriers to root growth:

Physical: The poorly structured dispersive subsoil restricts uniform root development. Although roots grow in the clay, they tend to be confined to the surfaces of the aggregates.

Chemical: High pH / sodicity, boron concentration and salinity from 25 cm impede deeper root growth.

Water holding capacity: Approximately 40 mm.

Seedling emergence: Fair. Patchy establishment is likely in some seasons due to the hard setting, sealing surface.

Workability: Fair due to narrow moisture range for effective working.

Erosion Potential

Water: Moderate. Soil is highly erodible, and even on this gentle slope, run on water from upslope can cause rilling.

Wind: Moderately low. The sandy surface is easily pulverized.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	Org.C %	NO ₃ mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO ₄ mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum of cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-10	7.2	6.8	nd	0.07	0.50	12	47	363	3.3	0.7	0.6	10.0	0.90	18.9	6.3	4.07	1.16	0.22	0.87	3.5
10-25	9.3	8.3	nd	0.24	0.35	3	5	434	9.7	5.3	1.19	3.7	0.31	4.66	13.4	5.41	3.93	3.00	1.02	22.5
25-70	9.7	8.6	nd	1.03	0.30	4	2	551	100	15.0	1.56	3.1	0.24	1.43	22.2	7.67	5.39	7.74	1.39	34.9
70-140	9.8	8.6	nd	1.03	0.12	2	3	513	144	10.5	0.57	4.1	0.29	1.34	21.6	6.37	5.62	8.37	1.25	38.7

Note: Sum of cations in neutral to alkaline soils is an approximation of cation exchange capacity (a measure of the soil's capacity to store and release major nutrient elements).

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the sum of cations.