SHALLOW CALCAREOUS LOAM GRADING TO CLAY LOAM ON CALCRETE

General Description: *Dark, calcareous loam topsoil, overlies very highly calcareous light grey clay loamy subsoil on a very hard calcrete base*

Subgroup soil: B5

Landform: Level plain

Substrate: Calcrete

Vegetation: Barley grass, ryegrass and clover.

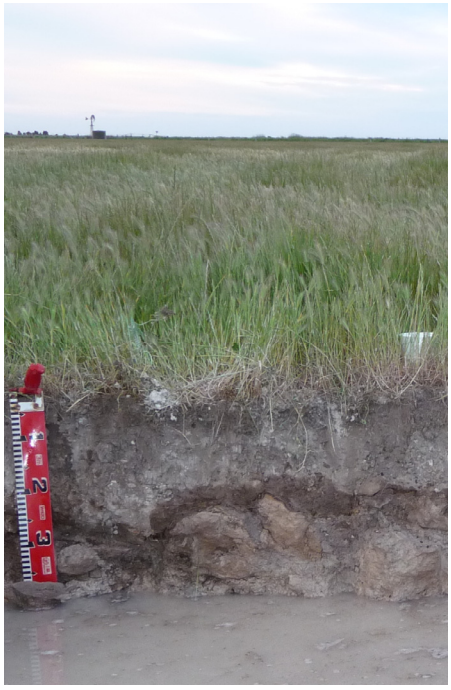
Type Site:

Site No:	SE154	1:50,000 mapsheet:	6923-4 (Konetta)
Hundred:	Conmurra	Easting:	418760
Section:	285	Northing:	5893310
Sampling date:	24/10/08	Annual rainfall:	650 mm average

Note: In the paddock are some outcrops of calcrete.

Soil Description:

Depth (cm)	*Description*
0–16	Hardsetting, highly calcareous, very dark greyish brown, loam with moderate, fine granular structure.
16–35	Very highly calcareous, dispersive, light grey, light clay loam with massive structure and >50% hard carbonate fragments and nodules.
35–45	Very highly calcareous, dispersive, light grey, clay loam with massive structure and >50% hard carbonate fragments and nodules.
45–60	Very strongly cemented, massive calcrete.



Note: at the time of sampling a watertable was evident at approximately 40 cm.

Classification: Epihypersodic, Petrocalcic, Lithocalcic Calcarosol; medium, slightly gravelly, loamy/clay loamy, shallow.

Alternatively: Natric, Calcarosolic, Oxyaquic Hydrosol; medium, slightly gravelly, loamy/clay loamy, shallow.

Summary of Properties

Drainage: Drainage is imperfect.

Fertility: Inherent fertility is relatively high: loamy to clay loamy texture, relatively high surface soil organic content, and little leaching (owing to clay content, shallow watertable and the calcrete base), ensure the soil has good capacity to retain and provide nutrients. However, much of the soil's natural fertility is provided by the organic matter present in the surface soil. Maintenance and improvement of surface soil organic matter and residues is important for maintenance of fertility. Phosphorus levels are low in the surface soil, but surprisingly raised in the subsoil.

pH: The soil profile is alkaline throughout.

Rooting depth: Root growth was observed to 45 cm (i.e. to the calcrete base) in the pit.

Barriers to Root Growth:

Physical: The very strongly cemented calcrete base limits root growth. However, some roots may grow deeper than this via cracks or solution holes in the calcrete. Dispersive subsoil will very likely result in some reduction in root growth, while hardsetting surface soil condition could be improved via retention of plant residues and the use of gypsum.

Chemical: Seasonal waterlogging is a potential problem in the soil profile (which could be exacerbated by the shallow watertable). Alkaline pHs throughout and associated fine carbonate content may result in reduced availability of some mineral elements (in particular, phosphorus, zinc, manganese and iron). Low levels of some nutrients in the subsoil (e.g. possibly zinc and boron) may limit root growth in these layers. Raised levels of salts occur in the subsoil.

Waterholding capacity: Low to moderately low. However, roots may access groundwater.
Total available: approx 40 mm [(0.16x170)+(0.19x150x0.4)+(0.1x150x0.2)].

Seedling emergence: Moderate to good.

Workability: Moderate to good.

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO_4-S mg/kg	Boron mg/kg	Al $CaCl_2$ mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg						Est. ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	Al	H	
Paddock	8.1	7.5	4.0	0.47	1.55	5.7	22	319	489	65	1.6	0	1.5	28	16.4	2.6	31.6	25.6	4.3	0.5	1.2	0.0	0.0	2
0-16	8.5	7.8	4.1	0.36		2.5	15	211	227	32.5	1.4	0	0.9	18	13.6	1.0	28.5	22.6	4.3	0.6	1.0	0.0	0.0	2
16-35	8.5	7.9	2.1	0.37	2.10	1.4	30	144	207	114	0.9	0	0.4	9	6.0	0.8	33.1	29.6	2.7	0.3	0.5	0.0	0.1	1
35-45	8.8	7.9	1.8	0.23	2.43	0.3	10	208	129	32.8	0.4	0	0.4	9	4.0	0.4	26.2	22.6	2.7	0.3	0.5	0.0	0.1	1
45-60																								

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

Sum of cations approximates the CEC (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 CEC, in this case estimated by the sum of cations.

Further information: DEWNR Soil and Land Program