SANDY LOAM OVER SODIC BROWN CLAY

General Description: *Massive grey sandy loam with a bleached subsurface layer, over a brown mottled coarsely structured clay, calcareous with depth*

Landform: Gently undulating plains

Substrate: Tertiary age clay

Vegetation: Eucalyptus camaldulensis woodland

Type Site:

Site No.:	SE158B	1:50,000 mapsheet:	7024-2 (Hynam)
Hundred:	Jessie	Easting:	484600
Section:	430	Northing:	5916400
Sampling date:	11/02/2008	Annual rainfall:	570 mm average

Flat. Firm surface with no stones. Irrigated lucerne.

Soil Description:

Depth (cm)	Description
0-10	Dark brown massive light sandy clay loam. Clear to:
10-20	Dark brown massive sandy loam. Abrupt to:
20-23	Very pale brown (bleached) massive sandy loam. Sharp to:
23-55	Brown and strong brown mottled light medium clay with strong coarse columnar structure, breaking to strong medium subangular blocky. Gradual to:
55-75	Strong brown light medium clay with moderate coarse prismatic structure, breaking to weak medium subangular blocky. Clear to:
75-115	Yellowish and reddish brown moderately calcareous light clay with weak medium subangular blocky structure, and 10-20% soft carbonate segregations. Diffuse to:
105-150	Brownish yellow sandy light clay with weak coarse prismatic structure and 2-10% soft carbonate segregations.
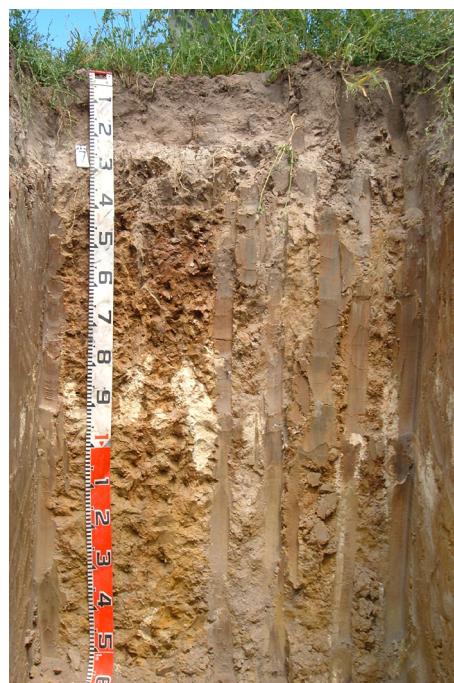
Classification: Calcic, Mottled-Mesonatric, Brown Sodosol; medium, non-gravelly, loamy / clayey, very deep

Summary of Properties

Drainage: Imperfectly drained. Water can perch on top of the subsoil clay for up to several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. Correction of acidity by irrigation water has had an (inadvertent) positive effect on cation retention. Laboratory data indicate adequate levels of all tested nutrient elements.

pH: Alkaline at the surface, neutral in the upper subsoil, and strongly alkaline in the deep subsoil. Note effect of irrigation water on topsoil pH (compare with site SE158A)

Rooting depth: 150 cm in sampling pit, but few roots below 75 cm.

Barriers to root growth:

Physical: The subsoil clay layer imposes a moderate restriction on root growth, mainly by confining many roots to the faces of coarse aggregates.

Chemical: Effective rootzone depth is limited to 75 cm by high pH and sodicity. Note that very high topsoil chloride levels, caused by irrigation water, are likely to be transient.

Waterholding capacity: (Estimates for potential rootzone of irrigated crops)
Total available: 115 mm
Readily available: 55 mm

Seedling emergence: Fair to satisfactory. Tendency to seal over can reduce establishment percentage.

Workability: Fair. Surface tends to shatter if worked too dry, and puddle if worked too wet.

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	NO_3+ NH_4 mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	React Fe mg/kg	Boron mg/kg	Cu	Fe	Mn	Zn	Sum cations cmol (+)/kg	Ca	Mg	Na	K	Est. ESP
0-10	8.1	7.4	0	0.60	3.64	665	2.03	11	58	52	87.3	529	1.7	0.38	53	3.56	2.04	10.9	5.86	2.71	2.18	0.12	20.1
10-20	8.1	7.1	0	0.49	4.04	536	1.60	-	39	43	52.0	615	-					8.7	4.71	2.15	1.69	0.08	19.5
20-23	7.5	6.9	0	0.22	3.21	272	0.45	-	27	96	20.5	229	-					3.1	1.69	0.74	0.63	0.04	20.1
23-55	7.6	6.7	0	0.59	2.69	563	0.81	-	40	439	43.7	2357	-					19.6	7.64	6.24	4.76	0.88	24.3
55-75	8.7	7.8	0	0.29	1.31	134	0.37	-	9	359	27.2	546	-					16.6	5.57	7.16	3.00	0.81	18.1
75-105	9.3	8.4	3.4	0.53	1.89	100	0.10	-	2	256	42.0	338	-					20.5	8.29	8.39	3.20	0.58	15.6
105-150	9.3	8.3	0	0.38	1.82	256	0.05	-	2	200	31.7	322	-					17.6	4.16	8.60	4.36	0.46	24.7

Note: Sum of cations, in a neutral to alkaline soil, 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