

SANDY LOAM OVER THICK YELLOW BROWN CLAY

General Description: *Thick sandy loam to loam with a bleached A2 layer, over a yellowish brown, grey and red mottled clay extending below 100 cm, becoming sandier and more gravelly with depth*

Landform: Lower slopes of undulating to rolling low hills and hills.

Substrate: Deeply weathered basement rock or locally derived gravelly colluvium.

Vegetation:



Type Site: Site No.: CH166

1:50,000 sheet: 6628-2 (Onkaparinga) Hundred: Onkaparinga

Annual rainfall: 850 mm Sampling date: 03/01/07

Landform: Lower slope of undulating low hills, 4% slope.

Surface: Firm to hard setting surface with no stones.

Soil Description:

Depth (cm)	Description
0-10	Very dark greyish brown friable silty loam with weak granular structure. Clear to:
10-23	Brown friable massive silty loam. Clear to:
23-58	Very pale brown (bleached) friable massive light fine sandy loam with 10-20% ferruginized phyllite fragments to 60 mm. Abrupt to:
58-90	Yellowish brown, light olive brown and red mottled firm light medium clay with strong medium angular blocky structure. Gradual to:
90-125	Light olive brown, yellowish brown and yellowish red firm medium clay with weak very coarse prismatic, breaking to weak angular blocky structure. Gradual to:
125-165	Dark yellowish brown, reddish brown and light olive brown firm sandy light clay with moderate angular blocky structure and more than 50% phyllite and quartz fragments.



Classification: Eutrophic, Mottled-Subnatric, Brown Sodosol; thick, non-gravelly, silty / clayey, deep

Summary of Properties

Drainage: Imperfectly to moderately well drained. The subsoil clay may perch water for a couple of weeks at a time following heavy or prolonged rainfall. However the thickness of the topsoil reduces the severity of impact of the perched water table.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. At the sampling site, levels of P are very high, but K concentrations are marginal (although ample in the subsoil). Trace element and sulphur levels are high. Reactive iron levels are very high, indicating a high potential for phosphate fixation

pH: Neutral to slightly acidic at the surface, neutral with depth.

Rooting depth: 150 cm in sampling pit, but few roots below 90 cm.

Barriers to root growth:

Physical: The clayey subsoil presents a partial barrier to root growth, reducing water use efficiency. This condition is exacerbated by increasing sodicity, presumably caused by irrigation water. Note that high apparent sodicity in the 23-58 cm layer is of minor significance due to the low clay content.

Chemical: There are no apparent barriers to root growth, although sodicity build-up in the topsoil and upper subsoil may have implications for product quality. Elevated salinity in the topsoil is attributable to irrigation water, and will be leached by winter rains.

Water holding capacity: Approximately 110 mm in the potential root zone.

Seedling emergence: Satisfactory.

Workability: These soils in non-irrigated situations shatter if worked too dry, and puddle if worked too wet. Under irrigation, organic matter levels are high, and moisture content can be controlled, so there are no restrictions on workability.

Erosion Potential

Water: Moderately low.

Wind: Low.

Laboratory Data

Depth cm	pH H ₂ O	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	React Fe 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	
0-10	7.2	6.4	0	0.49	3.42	3.72	298	99	363	82.7	0.7	2215	5.25	1160	96.5	16.4	20.0	11.7	6.19	1.88	0.25	9.4
10-23	7.1	6.1	0	0.38	3.35	2.57	255	83	338	72.5	0.4	2488	4.05	1050	78.1	10.0	13.6	7.62	4.20	1.58	0.20	11.6
23-58	7.0	6.5	0	0.28	3.64	0.28	83	74	308	45.5	0.2	759	0.6	245	13.3	1.86	3.5	1.37	1.14	0.87	0.15	24.6
58-90	7.3	6.4	0	0.23	1.66	0.31	10	666	179	56.6	1.2	730	0.96	43	1.89	0.34	11.1	4.74	3.55	1.19	1.60	10.7
90-125	7.4	6.5	0	0.23	1.58	0.23	4	777	140	59.6	0.7	682	0.87	36	26.0	0.31	10.2	3.75	3.53	0.98	1.89	9.7
125-165	7.5	6.5	0	0.18	1.83	0.21	6	522	130	38.2	0.6	919	0.66	90	12.4	0.31	6.8	2.75	2.19	0.76	1.06	11.2

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.