SAND OVER ACIDIC CLAY

General Description: *Medium to thick sandy surface soil with moderate to heavy ironstone gravel overlying a brown, yellow and red clay grading to highly weathered kaolinised soft sandstone.*

Landform: Upper slopes and crests of undulating rises and low hills associated with ancient glacial valleys

Substrate: Soft red, grey and yellow mottled kaolinised sandstone

Vegetation: Eucalyptus baxteri / Euc. fasciculosa scrub

Type Site: Site No.: CH015

1:50,000 sheet:	6627-3 (Willunga)	Hundred:	Nangkita
Annual rainfall:	800 mm	Sampling date:	29/07/92
Landform:	Upper slope of undulating low hills, 9% slope		
Surface:	Soft with a trace of ironstone		

Soil Description:

Depth (cm)	*Description*
0-12	Very dark grey soft light sandy loam. Clear to:
12-31	Very pale brown soft loamy sand. Abrupt to:
31-39	Reddish yellow soft loamy sand with up to 50% ironstone and sandstone. Abrupt to:
39-54	Brown friable light medium clay. Clear to:
54-75	Brownish yellow and light brown friable light clay. Gradual to:
75-150	Brown, red and yellow firm massive fine sandy clay. Diffuse to:
150-200	Yellow, white and red massive soft sandstone.

Classification: Bleached, Eutrophic, Brown Kurosol; thick, non-gravelly, loamy / clayey, very deep

Summary of Properties

Drainage Well drained. The soil is unlikely to remain wet for more than a few days.

Fertility The natural fertility of the soil is low to moderate, as indicated by the exchangeable cation data, although the surface relies on its organic matter content for satisfactory nutrient retention. The data indicate that although cation ratios are good, there are marginal deficiencies of calcium, magnesium and potassium. Manganese and copper are possibly deficient as well.

pH Acidic at the surface, strongly acidic at base. Dolomitic lime is needed for correction.

Rooting depth 150 cm at type site, although density is low from 75 cm.

Barriers to root growth

Physical: There are no physical barriers to root growth.

Chemical: Low pH, with possible associated aluminium toxicity, and nutrient leaching are the main limitations. Ironstone gravel tends to fix phosphorus, indicating higher rates are required.

Water holding capacity 180 mm in rootzone, but only about two thirds of this is effectively available because of poor root distribution.

Seedling emergence Good.

Workability Good, except for abrasive effects of ironstone.

Erosion Potential

Water: Moderate because of the slope and the low permeability of the clayey subsoil.

Wind: Moderately low. The light surface will erode if exposed.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	$CaCO_3$ %	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)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.9	5.5	-	0.08	0.37	3.9	70	190	-	1.0	0.9	99	2.3	2.6	7.4	4.9	1.4	<0.1	0.36	<1.5
											*0.7	*126	*6.1	*3.4						
0-12	6.0	5.6	-	0.07	0.26	3.4	12	120	-	0.7	0.2	103	1.4	1.7	5.7	4.0	1.4	<0.1	0.21	<2
12-31	5.6	4.8	-	0.04	0.14	0.4	5	120	-	0.5	<0.1	94	<0.1	<0.1	1.7	0.6	0.2	<0.1	0.25	na
31-39	5.3	4.7	-	0.06	0.16	0.8	8	220	-	0.8	0.8	254	0.2	0.5	4.4	1.4	0.5	0.12	0.50	2.7
39-54	5.3	4.6	-	0.06	0.14	1.1	<2	360	-	2.0	0.1	53	0.1	<0.1	11.1	3.3	2.9	0.29	0.94	2.6
54-75	5.5	5.2	-	0.06	0.16	0.4	<2	110	-	1.6	<0.1	9	<0.1	<0.1	8.9	2.3	4.0	0.25	0.28	2.8
75-150	5.2	5.0	-	0.05	0.27	<0.1	<2	25	-	0.8	<0.1	2	<0.1	<0.1	2.5	0.6	1.6	0.12	0.05	na
150-200	4.9	4.4	-	0.04	0.15	<0.1	<2	17	-	0.6	<0.1	2	<0.1	<0.1	2.2	0.4	1.1	0.12	<0.05	na

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

* EDTA trace element analyses for "paddock" sample.

CEC (cation exchange capacity) is 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.