SHALLOW LOAM OVER CALCRETED LIMESTONE

General Description: *Medium thickness crumbly calcareous loam over calcreted partly cemented very highly calcareous material*

Landform: Moderately steep slopes and rolling low hills.

Substrate: Partly cemented weathered limestone, infused with abundant windblown calcareous sand.

Vegetation:

Type Site: Site No.: CH153

1:50,000 sheet:	6527-2 (Yankalilla)	Hundred:	Willunga
Annual rainfall:	600 mm	Sampling date:	23/10/06
Landform:	Upper slope of rolling low hills, 12 % slope.		
Surface:	Firm with 2-10% calcrete fragments (20-200 mm).		

Soil Description:

Depth (cm)	*Description*
0-18	Dark reddish brown firm moderately calcareous loam with strong granular structure and 10-20% calcrete fragments (6-60 mm). Sharp to:
18-20	Strongly cemented laminar calcrete. Sharp to:
20-45	Very pale brown very highly calcareous weakly cemented sandy loam. Gradual to:
45-100	Very pale brown very highly calcareous weakly cemented clayey sand. Diffuse to:
100-135	Pink very highly calcareous weakly cemented clayey sand, with weathered siltstone fragments at base.

Classification: Ceteric, Petrocalcic, Calcic Calcarosol; medium, gravelly, loamy / -, very shallow

Summary of Properties

Drainage: Well drained. The soil is rarely likely to remain saturated for more than a day or so following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderately high, due to the relatively high clay content of the surface soil, and its high degree of calcium saturation (although Ca figures are exaggerated by high carbonate levels). However, carbonates (free lime) at the surface reduces availability of phosphorus and some trace elements, notably manganese and zinc. Levels of all trace elements at the sampling site are low to marginal. The material below the calcrete contributes little if anything to the nutrient supply.

pH: Alkaline throughout.

Rooting depth: Most roots occur above the calcrete, depth to which varies from 8 to 18 cm in the sampling pit. However, a few tree roots penetrate cracks in the calcrete and persist to the base of the pit (135 cm).

Barriers to root growth:

Physical: The calcrete is a major barrier to root growth, but survival of most plants, and certainly perennials relies on exploitation of cracks in the calcrete

Chemical: Low nutrient availability below the topsoil is the over-riding chemical limitation.

Water holding capacity: Approximately 15-35 mm above the calcrete (depending on the thickness of the topsoil), with an additional 80 mm or so in the highly calcareous material below. Probably less than half of this is effectively available due to low root densities.

Seedling emergence: Satisfactory.

Workability: Satisfactory except where calcrete is shallow enough to interfere with tillage and other equipment. Significant parts of these landscapes are too steep and rocky for any cultivation.

Erosion Potential

Water: The soil is inherently stable, but site erosion potential is moderate due to the slope.

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	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-18	8.0	7.4	10	0.23	0.77	4.24	54	525	12.8	1.7	1.13	11	13.3	2.59	41.6	37.3	2.43	0.45	1.43	1.1
18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-45	8.5	7.5	73	0.14	0.34	0.60	3	256	6.7	0.5	0.28	5	2.41	0.14	21.5	18.3	2.29	0.30	0.68	1.4
45-100	8.6	7.6	70	0.17	0.73	0.37	2	163	11.2	0.4	0.3	5	1.78	0.21	17.3	13.7	2.78	0.45	0.42	2.6
100-135	8.5	7.6	75	0.20	0.94	0.52	8	47	17.9	0.5	0.28	12	2.57	0.70	19.9	13.8	5.37	0.64	0.15	3.2

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

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.