GREY CRACKING CLAY

General Description: *Coarsely prismatic grey clay grading to light brownish grey prismatic heavy clay with slickensides and soft carbonate*

Landform: Swampy fluvio-lacustrine plain of the Naracoorte Creek.

Substrate: Pliocene - Recent clay

Vegetation: Red gum (Eucalyptus camaldulensis)

Type Site: Site No.: SE088

1:50,000 sheet:	7024-2 (Hynam)	Hundred:	Binnum
Annual rainfall:	550 mm	Sampling date:	14/10/04
Landform:	Slight rise on a swampy plain		
Surface:	Hard with no stones		

Soil Description:

Depth (cm)	*Description*
0-5	Very dark grey light to medium clay with weak coarse (100-200 mm) prismatic breaking to strong small (5-10 mm) polyhedral structure. Abundant roots. Abrupt change to:
5-30	Dark grey heavy fine sandy clay loam with weak 10-20 mm prismatic structure. Roots common. Gradual break to:
30-60	Grey fine sandy light to medium clay with moderate 50-100 mm prismatic structure. Roots common. Abrupt, irregular change to:
60-115	Light brownish grey heavy clay with moderate 50-100 mm prismatic breaking to strong 20-50 mm polyhedral structure. Few (2-10%) soft carbonate segregations. Gradual change to:
115-140	Heavy clay as above, with slickensides common. Few veins of soft carbonate. Clear change to:
140-150	Pale brown massive heavy clay.

Classification: Epihypersodic-Endocalcareous, Epipedal, Grey Vertosol; non-gravelly, fine/very fine, very deep

Summary of Properties

Drainage: Poorly drained. The cracking soil accepts water readily when dry, but after the cracks close, water moves slowly through the soil (heavy clay has low permeability), causing saturation for several months in most seasons. Swampy conditions are common.

Fertility: Inherent fertility is high, as indicated by the exchangeable cation data. Phosphorus levels are marginal and potassium levels are high at this site. Concentrations of sulphur and trace elements are adequate to high (zinc and manganese appear particularly high).

pH: Slightly acidic topsoil, grading to strongly alkaline below 30cm.

Rooting depth: 115 cm observed in pit.

Barriers to root growth:

Physical: Dense poorly structured subsoil restricts roots. Reactive subsoil below 115 cm further interferes with root development.

Chemical: High exchangeable sodium percentage below 60 cm restricts root growth.

Water holding capacity: Approximately 100 mm.

Seedling emergence: Surface soil takes some time to wet up (high wilting point), thereby delaying emergence.

Workability: Fair to good. Surface becomes sticky once soil is wet. Gypsum helps overcome this condition.

Erosion Potential

Water: Low

Wind: Low

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	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	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-5	6.6	5.9	0.2	0.08	0.59	3.9	29	504	20	5.1	1.5	1.2	240	5.7	85.3	25.3	16.7	6.9	0.5	1.2	1.9
5-30	7.3	6.8	0.4	0.17	0.99	0.7	6	248	46	4.9	0.7	0.9	100	4.1	72.7	14.5	8.5	4.5	1.0	0.6	6.7
30-60	8.6	7.7	1.2	0.24	1.26	0.2	4	254	134	7.4	1.9	0.6	33	0.5	50.4	18.2	7.7	6.8	3.1	0.6	16.9
60-115	8.9	8.1	0.6	0.61	2.50	0.1	3	336	421	52	7.4	0.6	34	0.4	33.5	35.1	12.3	13.1	8.9	0.9	25.2
115-140	9.0	8.1	6.4	0.68	2.83	0.1	3	265	414	71	8.2	0.4	11	0.4	2.6	28.2	10.7	9.7	7.1	0.7	25.3
140-150	9.1	8.2	0.6	0.43	2.87	0.1	3	166	313	51	5.3	0.3	25	0.5	24.2	18.1	6.5	6.5	4.7	0.4	25.9

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.