GRADATIONAL CALCAREOUS CLAY LOAM

General Description: *Calcareous clay loam becoming more clayey and calcareous with depth, grading to medium to heavy clay within 120 cm*

Landform: Gently undulating rises.

Substrate: Coarsely structured red and brown heavy clay (Hindmarsh Clay).

Vegetation:

Type Site: Site No.: CY024

1:50,000 sheet:	6429-1 (Kainton)	Hundred:	Kulpara
Annual rainfall:	380 mm	Sampling date:	23/12/93
Landform:	Lower slope of 3%		
Surface:	Firm with no stones		

Soil Description:

Depth (cm)	*Description*
0-10	Dark reddish brown soft highly calcareous clay loam with moderate granular structure. Abrupt to:
10-20	Dark reddish brown firm highly calcareous medium clay with moderate coarse subangular blocky structure. Clear to:
20-35	Dark reddish brown firm very highly calcareous light clay with moderate medium subangular blocky structure and 2-10% hard carbonate veins and nodules. Gradual to:
35-70	Yellowish red firm very highly calcareous light medium clay with moderate medium angular blocky structure. Diffuse to:
70-100	Yellowish red firm very highly calcareous medium clay with weak coarse angular blocky structure. Diffuse to:
100-145	Yellowish red and brown hard highly calcareous medium heavy clay with strong coarse angular blocky structure.

Classification: Ceteric, Pedal, Hypercalcic Calcarosol; medium, non-gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage Moderately well drained. Soil may remain wet for up to a week following heavy or prolonged rainfall.

Fertility Natural fertility is high as indicated by the exchangeable cation data. Surface fertility relies on organic matter levels which are adequate, and on phosphorus levels which are good at this site. Trace element deficiencies may occur from time to time

pH Alkaline at the surface, strongly alkaline at depth.

Rooting depth Approximately 130 cm in pit (few roots below 70 cm).

Barriers to root growth

Physical Hard poorly structured clay at depth caused by the high percentage of exchangeable sodium restricts root growth.

Chemical High boron concentrations and high sodicity from 100 cm prevent deeper root growth. Nutrient availability problems probably occur in the subsoil.

Water holding capacity Approximately 100 mm in rootzone, but less is effectively available due to low root density in the subsoil.

Seedling emergence Fair to good. Organic matter levels need to be maintained to preserve surface soil structure.

Workability Fair to good.

Erosion Potential

Water Moderately low.

Wind Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_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	8.2	7.9	2.2	0.16	0.52	1.5	38	579	-	3.3	1.0	7	7.6	0.5	31.4	27.2	4.2	0.5	2.4	1.7
0-10	8.2	7.8	3.5	0.16	0.53	1.4	42	512	-	3.4	1.0	7	8.8	1.2	29.6	26.0	4.5	0.3	2.2	1.1
10-20	7.9	7.7	1.0	0.15	0.40	0.9	12	253	-	3.5	1.4	10	3.1	0.2	29.4	24.3	4.7	0.6	1.4	2.1
20-35	8.2	7.8	7.8	0.16	0.31	0.5	7	147	-	3.4	1.3	8	2.7	0.1	24.6	19.0	5.4	0.7	1.0	2.8
35-70	8.5	7.9	30.1	0.18	0.36	0.1	7	113	-	2.9	1.2	7	2.2	0.2	19.2	12.4	5.9	1.1	0.7	5.8
70-100	8.9	8.0	39.8	0.23	0.60	0.3	6	176	-	2.9	1.2	7	1.8	0.1	18.5	8.1	8.0	2.4	0.8	12.9
100-145	9.2	8.5	14.5	0.68	1.80	0.1	4	343	-	31.6	0.9	8	1.0	0.1	27.2	6.9	14.6	7.7	1.5	28.1

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

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