BLACK CRACKING CLAY

General Description: *Dark brown cracking clay, overlying a coarsely structured reddish clay with variable soft carbonate*

Landform: Gently undulating slopes and flats

Substrate: Reddish, coarsely structured heavy clay (Hindmarsh Clay equivalent)

Vegetation:

Type Site: Site No.: CM043

1:50,000 sheet:	6630-3 (Clare)	Hundred:	Upper Wakefield
Annual rainfall:	625 mm	Sampling date:	11/08/93
Landform:	Lower slope of an undulating low hill, 4% slope		
Surface:	Seasonally cracking with about 5% quartzite stones		

Soil Description:

Depth (cm)	*Description*
0-10	Very dark brown medium clay with strong granular structure. Clear to:
10-20	Very dark brown medium clay with strong angular blocky structure and 2-10% quartzite stones. Clear to:
20-40	Dark brown heavy clay with strong coarse angular blocky structure and minor quartzite stones. Gradual to:
40-55	Very dark brown heavy clay with strong coarse blocky structure and slickensides. Gradual to:
55-85	Dark brown medium heavy clay with strong lenticular structure. Clear to:
85-140	Orange highly calcareous heavy clay with strong lenticular structure and 2-10% soft carbonate segregations (Hindmarsh Clay equivalent).

Classification: Haplic, Epipedal, Black Vertosol; slightly gravelly, medium fine / very fine, moderate

Summary of Properties

Drainage The soil is imperfectly drained due to its high clay content. The profile may remain wet for several weeks.

Fertility Inherent fertility is high, as indicated by the exchangeable cation data (viz. the high CEC and the dominance of calcium in the upper 40 cm). Zinc deficiency is the most likely nutrition problem, apart from phosphorus, levels of which are satisfactory at the sampling site. The organic carbon content is high.

pH Neutral at the surface, grading to alkaline with depth.

Rooting depth There are very few roots below 85 cm. These are confined to cracks which have filled with soil from above.

Barriers to root growth

Physical: The high strength of the clay is the main physical limitation to root growth.

Chemical: High boron levels are associated with the Hindmarsh Clay, the depth to which can vary from less than 50 cm to over a metre in these soils. Where it is at shallow depth, the effects of boron toxicity will be evident.

Water holding capacity Approximately 130 mm in the root zone. These clay soils have a very high wilting point, so moisture stress occurs even at relatively high soil water contents.

Seedling emergence Good, although there is a tendency for these soils to seal over.

Workability Fair. These soils become very sticky and difficult to work when wet.

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	
Row	7.2	7.1	0	0.42	1.47	2.0	36	608	-	2.4	3.2	26	8.8	2.1	34.8	30.71	5.41	0.33	1.53	0.9
0-10	7.0	6.9	0	0.36	1.69	2.3	54	669	125	2.9	3.4	37	11.2	2.3	31.2	26.83	4.76	0.31	1.72	1.0
10-20	7.0	6.8	0	0.21	0.90	1.7	7	461	105	2.3	1.3	26	12.1	0.9	34.0	25.08	6.90	0.47	1.29	1.4
20-40	7.2	6.9	0	0.24	0.94	1.2	<4	309	92	2.9	1.2	25	8.4	0.2	39.7	27.99	10.91	1.11	0.98	2.8
40-55	8.0	7.6	0.3	0.27	0.84	0.8	<4	242	81	3.5	0.9	17	3.5	0.1	41.3	22.42	12.72	2.25	0.76	5.4
55-85	8.3	8.0	1.1	0.35	0.91	0.7	<4	232	76	5.8	0.9	14	2.5	0.1	41.0	21.89	16.20	3.86	0.72	9.1
85-140	8.7	8.1	9.7	0.52	0.93	0.3	<4	345	66	13.6	0.9	14	2.4	0.1	41.3	15.56	18.27	6.72	0.80	16.3

Note: Row sample bulked from 20 cores (0-10 cm) taken from along the vine rows 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.