

GREY-BROWN CRACKING CLAY

General Description: *Hard grey to brown cracking clay, calcareous with depth*

Landform: Undulating to rolling rises and low hills. Slope range is 3% to 30%

Substrate: Heavy clays, deposited in ancient glacial valleys

Vegetation: Grassland



Type Site: Site No.: CH003

1:50,000 sheet: 6527-2 (Yankalilla)

Hundred: Yankalilla

Annual rainfall: 625 mm

Sampling date: 30/01/92

Landform: Lower slope of undulating rise, 4% slope.

Surface: Hard-setting and cracking with no stones.

Soil Description:

Depth (cm)	Description
0-12	Dark greyish brown strongly coarse prismatic very hard medium clay. Clear to:
12-34	Dark greyish brown and light olive brown strongly coarse prismatic medium heavy clay. Clear to:
34-60	Brown and light olive brown strongly blocky medium heavy clay, with minor soft Class I carbonate. Gradual to:
60-110	Brown and light yellowish brown strongly blocky highly calcareous medium heavy clay with minor soft carbonate. Diffuse to:
110-160	Light grey and olive yellow strongly blocky heavy clay with traces of carbonate.



Classification: Episodic-Epicalcareous, Epipedal, Brown Vertisol

Summary of Properties

Drainage	Imperfect. Soil may remain wet for several weeks.
Fertility	High natural fertility as indicated by the high cation exchange capacity. These soils are prone to deficiencies of phosphorus and zinc.
pH	Alkaline throughout.
Rooting depth	Root growth is minimal below 60 cm.
Barriers to root growth	
Physical:	High clay strength indicated by the very high exchangeable sodium percentages inhibits root growth. Roots may also be damaged by the cracking of the clay as it dries.
Chemical:	High levels of boron (critical limit is 15 mg/kg), and high surface salinity (more than 4 dS/m ECe) adversely affect root growth. Root growth is also generally poor in Class I carbonate layers.
Water holding capacity	Up to 200 mm, but only 70 to 100 mm in rootzone (moderate). Because of the physical and chemical barriers preventing the development of strong root systems, water use efficiency in these soils is low.
Seedling emergence	Fair to poor, due to hard setting surface and waterlogging.
Workability	Poor. Very hard when dry, sticky and boggy when wet. There are no rocks and stones to interfere with tillage.
Erosion potential	
Water:	Moderate. Although clayey surfaces usually resist erosion, the high sodicity suggests that the surface soil is not very stable and is prone to washing.
Wind:	Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl 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	
0-12	7.9	7.7	0.3	4.58	35.0	1.5	42	410	5840	15.4	0.9	22	6.2	0.2	27.2	8.6	8.6	10.6	1.3	39
12-34	8.2	7.9	0.1	2.38	12.6	0.4	27	560	2780	23.0	0.7	7	1.2	<0.1	30.4	8.2	10.5	11.8	1.8	39
34-60	8.9	8.4	7.3	1.68	7.9	0.3	78	480	1840	15.3	0.6	7	1.0	0.1	29.4	8.3	11.3	10.4	1.5	35
60-110	8.9	8.4	5.7	1.33	5.1	0.2	49	490	1330	13.1	0.6	6	0.8	<0.1	32.5	9.4	12.4	10.3	1.6	32
110-160	8.8	8.3	3.1	1.62	3.9	0.1	54	580	1620	11.6	0.4	8	<0.5	0.1	33.2	10.3	14.2	11.3	1.6	49

Note: 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.