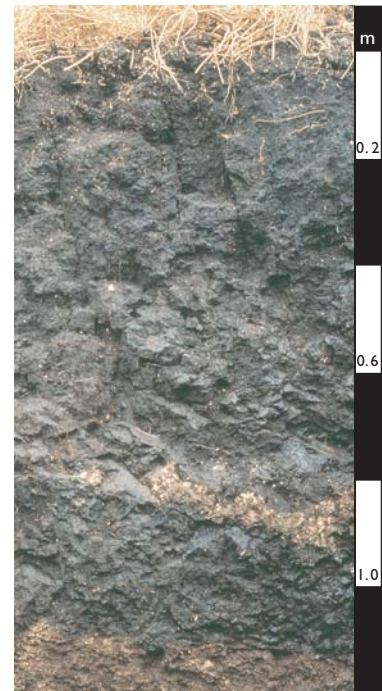


## VE12: Haplic, Self-mulching, Black Vertisol

### General description of the soil

A black, shrink-swell, cracking clay soil that is self-mulching. The solum is non-clacareous and not strongly sodic.

<b>Distribution:</b>	Widely distributed but in relatively small areas on basic igneous rocks (basalt and dolerite) and sediments (lithic and felspathic sandstones and shales, and derived alluvial and colluvial sediments), particularly in the semi-arid subcoastal zone extending from central Queensland to central New South Wales.
<b>Typical land use:</b>	Summer and winter dryland cropping of cereals and oilseeds. Irrigated agriculture, especially cotton. Grazed native pasture in regions of unreliable rainfall.
<b>Common variants:</b>	Black Vertisols may range in depth from 0.3 m to 2.0 m or more and gilgai microrelief is common. Calcareous segregations may occur higher in the profile (Endocalcareous or Epicalcareous). Massive or coarsely structured soils and profiles with a pedal surface soil condition may also occur. Aquic types occur on some northern coastal plains.
<b>World Reference Base:</b>	Grumic Vertisol.
<b>Other names:</b>	Black Earths and Black Cracking Clays.



Eastern Darling Downs, south Queensland

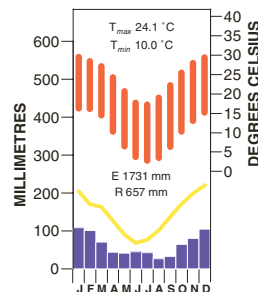
### Environment and location of the example profile

<b>Landform:</b>	Undulating plains.
<b>Substrate:</b>	Basalt.
<b>Drainage class:</b>	Imperfectly drained.
<b>Surface condition:</b>	Self-mulching and periodic cracking.
<b>Site disturbance:</b>	Cleared.
<b>Native vegetation:</b>	Open woodland.
<b>Microrelief:</b>	Linear gilgai

### Site location



### Site climate



### Soil morphology

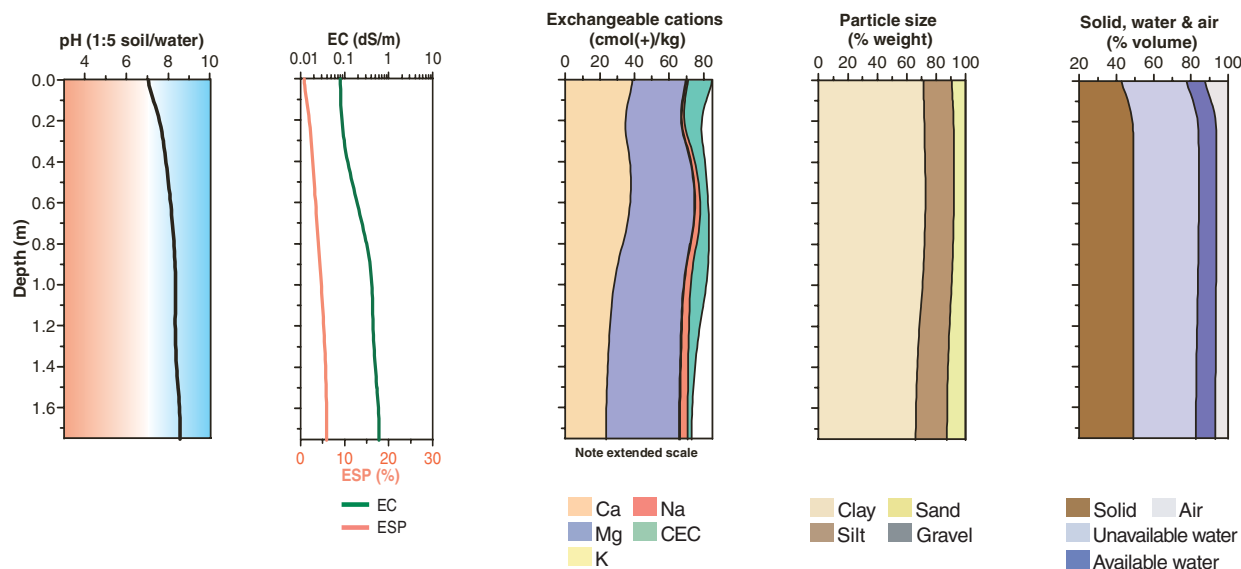
Horizon	Depth (m)	Colour	Mottles	Texture	Structure			Consistence	Coarse fragments	Segregations	Boundary
					Grade	Shape	Size				
A1	0.00–0.03	black (10YR 2/1)	–	medium clay	strong	granular	<2 mm	firm (moderately moist)	–	–	abrupt
B21	0.03–0.20	black (10YR 2/1)	–	medium clay	strong	subangular blocky parting to granular	2–5 mm parting to <2 mm	firm (moderately moist)	–	–	clear
B22	0.20–1.10	black (10YR 2/1)	tongue of brown clay containing soft carbonate at 0.9 m	medium heavy clay	strong	lenticular (slickensides)	5–10 mm parting to <2 mm	firm (moist)	–	–	abrupt
BC	1.10–1.75	brown (7.5YR 3/4)	–	medium heavy clay	strong	lenticular	10–20 mm parting to 2–5 mm	firm (moist)	–	20–10% soft carbonate (2–6 mm)	

### Soil chemical and physical properties

Horizon	Sample Depth (m)	pH H <sub>2</sub> O <sup>A</sup>	pH CaCl <sub>2</sub> <sup>C</sup>	Elect. Cond. dS/m <sup>A</sup>	CaCO <sub>3</sub> %	Org. C %	Extr. P mg/kg	Tot. P % <sup>A</sup>	Tot. K % <sup>A</sup>	Cation exchange properties <sup>C</sup> cmol(+)/kg						ESP % <sup>A</sup>	Bulk dens. Mg/m <sup>3</sup>	Particle size %			
										Ca	Mg	K	Na	H+Al	CEC			ECEC	CS	FS	Silt
A1	0.00–0.03	7.1	6.7	0.08				0.098	0.598	38.0	30.0	0.6	0.8		83		1	1	8	19	70
B21	0.03–0.20	7.7	7.1	0.08				0.102	0.702	32.0	32.0	0.4	1.7		76		2	1	7	20	72

Horizon	Sample Depth (m)	pH H <sub>2</sub> O <sup>A</sup>	pH CaCl <sub>2</sub> <sup>C</sup>	Elect. Cond. dS/m <sup>A</sup>	CaCO <sub>3</sub> %	Org. C %	Extr. P mg/kg	Tot. P % <sup>A</sup>	Tot. K % <sup>A</sup>	Cation exchange properties <sup>C</sup> cmol(+)/kg							ESP % <sup>A</sup>	Bulk dens. Mg/m <sup>3</sup>	Particle size % <sup>I</sup>			
										Ca	Mg	K	Na	H+Al	CEC	ECEC			CS	FS	Silt	Clay
B22	0.20–0.80	8.1	7.7	0.14				0.106	0.737	40.0	37.0	0.4	2.7		83		3		1	7	19	71
B22	0.80–1.10	8.4	7.6	0.44				0.107	0.794	28.0	40.0	0.4	3.8		83		5					
BC	1.10–1.20	8.3	7.6	0.44				0.134	0.968	24.0	42.0	0.5	4.3		74		6		1	11	21	67
BC	1.50–1.75	8.6	7.9	0.62																		

### Key profile properties



### General qualities of the soil

<b>Infiltration:</b>	Moderate to slow when swollen.
<b>Available water store:</b>	Moderate to large.
<b>Permeability:</b>	Moderate to low when swollen.
<b>Physical root limitations:</b>	Plough pans are common and will often limit root growth.
<b>Erosion hazard:</b>	Serious on slopes in high intensity rainfall regions (tropics and subtropics).
<b>Nutrient availability:</b>	Nitrogen levels decline under cropping. Commonly deficient in sulfur and zinc.
<b>Toxicities:</b>	None likely.



**Self-mulching Black Vertosols on the Darling Downs in south Queensland are prone to erosion during intense storms.**

*Acknowledgements:* Soil image, soil description and laboratory data from Department of Natural Resources and Mines, Queensland. Irving soil. Landscape image: George Hubble, CSIRO.