

COL Coolinong Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Gently undulating stony plain with scattered sandhills and saline depressions in the Cooke Plains area

Area: 84.5 km²

Annual rainfall: 380 – 415 mm average

Geology: The land is formed on calcarenites capping ancient coastal sand dunes, interspersed with Bungunnia Limestone equivalent. Deposits of Molineaux Sand are scattered across the landscape and thin layers of lake bed clay occur on some flats. Reworking of old lake floor sediments has created a large lunette on the western edge of the System.

Topography: The landscape is a complex of stony rises formed on the subdued remnants of old coastal sand dunes. These stony rises are variably overlain by low sandhills and sand spreads. Between these stony areas are sandy and stony flats formed on the Bungunnia Limestone. Sand spreads and low sandhills also overlie the flats. Depressions on the flats are usually salty due to a high saline water table.

Elevation: 2 - 10 m

Relief: 2 - 5 m

Soils: Most soils are shallow to moderately shallow on calccreted calcarenite. These have sandy to sandy loam surfaces and variable but thin clayey subsoils. Deeper sands commonly overlie these soils. Rising water tables have caused wet saline soils to develop in depressions.

Main soils

B3 Shallow stony sandy loam - stony flats and rises

B7b Loamy sand over red sandy clay on calcrete - sandy flats

Minor soils

Sandy flats

B8 Bleached sand on calcrete

Sandy rises and sandhills

H2 Deep sand

G2 Sand over sandy clay loam

Sandy depressions

B7a Sand over grey sandy clay loam on calcrete

Moderately to highly saline flats

N2 Saline calcareous clay loam

B5 Black clay loam on calcrete

Lunettes

G2/G3 Loamy sand over grey-brown sandy clay

Main features: The Coolinong Land System is a complex of stony rises and flats, sand plains and saline depressions, with sandhills superimposed over the older land surface. The stony areas are generally arable, but productivity is limited by low waterholding capacity and rockiness. The sand plains are infertile with shallow soils prone to wind erosion. The sandhills are also infertile, water repellent and highly susceptible to wind erosion. The area of saline flats can be expected to expand in response to rising watertables.



Soil Landscape Unit summary: 8 Soil Landscape Units (SLUs) mapped in the Coolinong Land System:

SLU	% of area	Main features #
MFa Mwb	6.6 19.9	<p>Flats and low rises formed on calcreted calcarenites of the Bridgewater Formation.</p> <p>MFa Very gently undulating stony plains with marginally saline depressions. Mwb Gently undulating low rises with extensive sand spreads and marginally saline depressions.</p> <p>Main soils: <u>shallow stony sandy loam</u> - B3 (V-D) on stony rises and flats, <u>deep sand</u> - H2 and <u>sand over sandy clay loam</u> - G2 (C) on sand spreads, and <u>sand over grey sandy clay loam on calcrete</u> - B7a (M) in depressions. The predominant soils are shallow with restricted waterholding capacity and moderately low fertility. Except for some minor rocky areas they are arable. Soils on the sand spreads are infertile, water repellent and prone to wind erosion.</p>
NeB NeI NeQ	39.2 9.9 6.1	<p>Flats formed on Bungunnia Limestone equivalent.</p> <p>NeB Flats with up to 10% low sandy rises and up to 10% low stony rises. NeI As for NeB, but with up to 10% saline depressions. NeQ Flats with 10-30% low sandhills, up to 10% low stony rises and about 10% saline depressions.</p> <p>Main soils: <u>loamy sand over red sandy clay on calcrete</u> - B7b (E), <u>bleached sand on calcrete</u> - B8 (L) and <u>shallow stony sandy loam</u> - B3 (E), with <u>deep sand</u> - H2 (M-L) and <u>sand over sandy clay loam</u> - G2 (M-C) on sandhills and <u>sand over grey sandy clay loam on calcrete</u> - B7a (M) in depressions. All soils have restricted root zones, so water availability is the major limitation to crop productivity, especially on the shallow soils over calcrete. The sandier soils have lower fertility than the loamier types, and are more susceptible to water repellence and wind erosion. Saline water tables are shallow in places and rises in levels can be expected to continue.</p>
NfQ	13.5	<p>Flats formed on Bungunnia Limestone equivalent with extensive sand spreads and 10-20% saline depressions and swamps.</p> <p>Main soils: <u>shallow stony sandy loam</u> - B3 (L), <u>loamy sand over red sandy clay on calcrete</u> - B7b (E) and <u>black clay loam on calcrete</u> - B5 (L) on flats, <u>deep sand</u> - H2 (L) and <u>sand over sandy clay loam</u> - G2 (M) on sand spreads, and <u>saline calcareous clay loam</u> - N2 (M) and <u>sand over grey sandy clay loam on calcrete</u> - B7a (M) in swamps and depressions. These flats have had extensive redistribution of sand over time, so many areas are covered by varying thicknesses of sand. The sands are infertile, prone to wind erosion and often water repellent. The soils of the flats and depressions are either shallow and stony, sandy and infertile or moderately to highly saline. This is marginal cropping land. Continuing rises in saline water tables can be expected.</p>
ZB-	1.3	<p>Saline samphire flats.</p> <p>Main soil: <u>saline calcareous clay loam</u> - N2 (D). These areas are too saline for cropping, but have some opportunistic grazing value. Protection of existing vegetation and revegetation with salt tolerant pastures or perennial shrubs are the main management considerations.</p>
ZL-	3.5	<p>Low rises (lunette of an ancient lake).</p> <p>Main soil: <u>loamy sand over grey-brown sandy clay</u> - G2/G3 (D). This land is arable, the main limitations likely to be moderate salinity and low fertility.</p>

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- (D) Dominant in extent (>90% of SLU)
- (V) Very extensive in extent (60–90% of SLU)
- (E) Extensive in extent (30–60% of SLU)
- (C) Common in extent (20–30% of SLU)
- (L) Limited in extent (10–20% of SLU)
- (M) Minor in extent (<10% of SLU)



Detailed soil profile descriptions:

- B3** Shallow stony sandy loam (Petrocalcic, Red Kandosol or Petrocalcic, Leptic Tenosol)
Medium thickness firm sandy loam with a paler coloured A2 layer and variable calcrete stones (sometimes grading to a red sandy clay loam), over calcrete at depths ranging from 15 to 35 cm.
- B5** Black clay loam on calcrete (Black Dermosol)
Medium thickness black clay loam to clay overlying calcrete or buried soils, with a water table between 100 and 200 cm.
- B7a** Sand over grey sandy clay loam on calcrete (Petrocalcic, Grey Sodosol)
Medium thickness loamy sand abruptly overlying a thin light grey sandy clay loam on calcreted medium textured sediments at about 40 cm with a water table between 100 and 200 cm. Occurs in depressions.
- B7b** Loamy sand over red sandy clay on calcrete (Petrocalcic, Red Chromosol)
Medium thickness loamy sand with a sandier and bleached A2 layer abruptly overlying a red massive sandy clay on calcrete from about 35 cm, grading to Bungunna Limestone equivalent, with a water table between 100 and 200 cm.
- B8** Bleached sand on calcrete (Petrocalcic, Bleached-Leptic Tenosol)
Medium thickness grey brown sand with a bleached sandy A2 layer directly overlying calcrete at about 30 cm.
- G2** Sand over sandy clay loam (Hypercalcic, Red Chromosol)
Very thick grey brown loose sand with a paler coloured or bleached A2 layer over a yellowish red or brown sandy clay loam, highly calcareous from about 80 cm.
- G2/G3** Loamy sand over grey-brown sandy clay (Hypercalcic, Grey / Brown Sodosol)
Medium thickness loamy sand to sandy loam over a dark grey to brown sandy clay loam to light clay, highly calcareous from depths ranging from 20 to 80 cm and becoming sandier with depth.
- H2** Deep sand (Basic, Arenic, Brown-Orthic Tenosol)
Grey brown loose sand, paler coloured with depth grading to an orange loamy sand below 100 cm.
- N2** Saline calcareous clay loam (Calcarosolic, Salic Hydrosol)
Thin highly calcareous dark grey clay loam over a pale brown to white very highly calcareous sandy clay loam with a water table between 50 and 100 cm.

Further information: [DEWNR Soil and Land Program](#)

