

SAN

Sandergrove Land System

Gentle slopes between Strathalbyn and Finniss

Area: 34.2 km²

Annual rainfall: 425 – 525 mm average

Geology: The land is underlain by clayey sand to sandy clay sediments washed out from the ranges to the west. These overlie older heavy clay sediment (Blanchetown Clay) which is near the surface in lower lying areas. All sediments are veneered by highly calcareous Woorinen Formation carbonates, either as soft segregations, or as nodules. Occasionally the carbonate is indurated. There is a remnant calcreted land surface (an outlier of the Burnlea Land System) at the northern end of the System.

Topography: The landscape is essentially an even east facing slope with gradients of 1 - 2%, rising to 4% at the western margins. The surface is dissected by well defined water courses from the ranges, but these usually dissipate within the System. Flood waters flow across the landscape into Sandergrove Creek. In the north is a calcreted bench, a remnant of an older land surface. Saline ground water from the ranges reaches the surface in places causing salt scalds.

Elevation: 40 m on the eastern side to 80 m on the west

Relief: The slopes are long and even, with local relief of less than 5 m

Soils: Texture contrast soils dominate the land. The main differences are due to variations in surface texture from soft sand to hard loam, and the nature of the subsoil. Subsoils vary from friable well drained clay loams to dispersive poorly drained and waterlogged clays.

Main soils:	D2	Hard loam over red clay
	G4a	Sand over poorly structured clay
	G4b	Sand over poorly structured clay with rubble

Minor soils:	<i>Hard setting texture contrast soils</i>	
	D3	Loam over poorly structured red clay
	D5	Hard loamy sand over red clay
	F2	Sandy loam over poorly structured brown clay
	<i>Sandy surface texture contrast soils</i>	
	B7	Shallow sand over clay on calcrete
	G3	Thick sand over clay
	<i>Calcareous and gradational soils</i>	
	A4	Deep rubbly calcareous loam
	B2	Shallow calcareous loam on calcrete
	C1	Gradational red sandy loam

Main features: The Sandergrove Land System is a gently sloping tract of land characterized by sandy to sandy loam texture contrast soils. Most have sodic clay subsoils which perch water and restrict root growth. Deeper subsoils are highly alkaline and moderately saline. Sandy surface soils are easily worked but are less fertile than the harder sandy loam types, which present some difficulties for cultivation, emergence and infiltration. All soils are susceptible to water erosion on slopes, and the sandier forms are prone to wind erosion.



Soil Landscape Unit summary: 15 Soil Landscape Units (SLUs) mapped in the Sandergrove Land System

SLU	% of area	Main features #
GRA GRB	17.9 10.2	<p>Flats and gentle slopes formed on clayey sand to sandy clay sediments.</p> <p>GRA Flats.</p> <p>GRB Gentle slopes.</p> <p>Main soils: <u>Sand over poorly structured clay with rubble</u> - G4b (V) <u>Sand over poorly structured clay with rubble</u> - G4a (L) <u>Thick sand over clay</u> - G3 (L) <u>Shallow sand over clay on calcrete</u> - B7 (M)</p> <p>These soils have low natural fertility and restricted waterholding capacities due to the often shallow depth to dispersive clayey subsoils and hostile carbonate layers. They are susceptible to wind erosion, and slopes are prone to water erosion. Most have marginally saline subsoils. Thicker sands are prone to acidification.</p>
HEA HEB HEg	30.7 5.3 1.9	<p>Very gently undulating plains and gently inclined slopes underlain by Blanchetown Clay, calcified by aeolian carbonates and partly overlain by calcareous aeolian deposits of the Woorinen Formation.</p> <p>HEA Very gently undulating plains and valley floors with slopes of 1-2%.</p> <p>HEB Gently inclined slopes and low rises with slopes of 2-5%.</p> <p>HEg Very gentle slopes extensively salinized by rising ground water tables.</p> <p>Main soils: <u>Loam over red clay</u> - D2 (E) <u>Gradational red sandy loam</u> - C1 (C) <u>Hard loamy sand over red clay</u> - D5 (L) <u>Deep rubbly calcareous loam</u> - A4 (L)</p> <p>These soils are mostly deep and inherently fertile, although boron levels are elevated in subsoils. Poorly structured surfaces are a minor limitation in D2 and D5, while shallow carbonate layers may restrict rootzone depth in places. Productivity potential is high, except on the salt affected land, where establishment of salt tolerant plants is necessary.</p>
HZA HZE HZJ	4.1 1.7 3.6	<p>Depressions, flats and shallow drainage depressions underlain by Blanchetown Clay within a metre, calcified by aeolian carbonates. Slopes are less than 2%.</p> <p>HZA Depressions and flats.</p> <p>HZE Shallow drainage depressions.</p> <p>HZJ Shallow drainage depressions with eroded water courses.</p> <p>Most soils have texture contrast profiles with sandy to sandy clay loam surfaces and mottled dispersive sandy clay to clay subsoils grading to highly calcareous clay (Class I carbonate) with depth.</p> <p>Main soils: <u>Sandy loam over poorly structured brown clay</u> - F2 (E) <u>Sand over poorly structured brown clay</u> - G4a (C) <u>Loam over poorly structured red clay</u> - D3 (L) <u>Thick sand over sandy clay</u> - G3 (L)</p> <p>Although deep, these soils are generally imperfectly drained and have poor root growth conditions due to their dispersive clay subsoils and boron toxicity. Natural fertility levels are moderate (loamy soils) to low (sandy soils).</p>
HaA HaB HaE HaF HaG HaH	2.1 0.7 2.4 12.2 1.9 1.9	<p>Outwash fans, plains and shallow drainage depressions with slopes of up to 6%, formed on alluvial clays, weakly calcified. Moderately well defined watercourses traverse fans at widely spaced intervals.</p> <p>HaA Flat plains and drainage depressions with slopes of 0-1%.</p> <p>HaB Very gently inclined fans with slopes of 1-3%.</p> <p>HaE Drainage depressions.</p> <p>HaF Flats with eroded water courses.</p> <p>HaG Very gently inclined fans with eroded water courses.</p> <p>HaH Gently inclined fans with slopes of 3-6% and eroded water courses.</p> <p>Soils are mixed hard setting and sandy texture contrast types.</p> <p>Main soils: <u>Loam over poorly structured red clay</u> - D3 (E) <u>Sand over poorly structured clay</u> - G4a (E) <u>Sandy loam over poorly structured brown clay</u> - F2 (L) <u>Loam over red clay</u> - D2 (M)</p> <p>These soils are deep but most have poorly structured dispersive subsoils which impede water movement and restrict root growth. On slopes, the soils are susceptible to water erosion. Fertility is moderate (loamy types) to low (sandy types).</p>



SdB	3.4	<p>Low benches and gently undulating low rises with relief of less than 10 m and slopes of less than 4%, formed on rubbly to sheet calcrete overlying Tertiary sands to sandy clays, or Blanchetown Clay. Surface calcrete stone is common and there is minor sheet rock outcrop. There is no surface drainage pattern. Soils are variable, but all overlie rubbly or sheet calcrete.</p> <p>Main soils: <u>Shallow calcareous loam on calcrete - B2</u> (E) <u>Gradational red sandy loam - C1</u> (C) <u>Deep rubbly calcareous loam - A4</u> (C) <u>Loam over red clay - D2</u> (M)</p> <p>These soils are mostly arable, despite a proportion of shallow soils on calcrete. Waterholding capacities vary considerably, but are generally limiting. Root growth is limited either by sheet calcrete or high pH below the rubble layer. Fertility is moderate to low. Most soils are easily worked, and well aerated and drained. Productive capacity is moderate.</p>
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PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

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

Detailed soil profile descriptions:

A4 Deep rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)

Medium thickness brown calcareous loamy sand to light sandy clay loam with minor calcrete nodules, overlying a brown highly calcareous massive sandy clay loam, grading to a pale brown, very highly calcareous clayey sand to light clay with up to 50% calcrete nodules (Class III B carbonate). The carbonate layer grades to a brown, yellow, grey and red sandy clay from 65 cm.

B2 Shallow calcareous loam on calcrete (Petrocalcic Calcarosol)

Medium thickness brown moderately calcareous loamy sand to light sandy clay loam with variable calcrete fragments, overlying sheet calcrete or heavy rubble. Grades to very highly calcareous pale brown sandy loam to clay loam with decreasing rubble, overlying Blanchetown Clay at depths from 100 cm to 10 m.

B7 Shallow sand over clay on calcrete (Petrocalcic, Subnartic, Brown Sodosol)

Thin brown sand to sandy loam with a pink A2 layer, overlying an orange sandy clay loam to light clay with calcrete fragments. At 30 cm is a layer of massive or rubbly calcrete, grading to a pale brown very highly calcareous clayey sand to sandy clay.

C1 Gradational red sandy loam (Supracalcic, Red Kandosol)

Medium thickness reddish loamy sand to light sandy clay loam, grading to a red brown weakly structured sandy clay loam to light clay, over a highly calcareous layer with Class III B carbonate nodules from 30 cm. Brown, yellow, red and grey clayey sand to sandy clay underlies the carbonate at 70 cm.

D2 Loam over red clay (Sodic, Hypercalcic, Red Chromosol)

Medium thickness red brown loamy sand to clay loam with weak structure, overlying a dark reddish brown clay with strong blocky structure, highly calcareous from 30 cm, with abundant soft carbonate segregations. The carbonate grades to Hindmarsh or Pooraka Clay at 90 cm.

D3 Loam over poorly structured red clay (Calcic, Subnartic, Red Sodosol)

Medium thickness reddish brown massive sandy loam to sandy clay loam with a paler A2 layer, overlying a reddish brown and greyish brown mottled clay with strong blocky structure and soft Class I carbonate segregations from 55 cm. Soil overlies a dark brown mottled clay with decreasing amounts of carbonate.

D5 Hard loamy sand over red clay (Hypercalcic, Red Chromosol)

Medium thickness reddish loamy sand to sandy loam, overlying a yellowish red weakly structured sandy clay to medium clay, grading to a highly calcareous layer with abundant soft carbonate from 30 cm (Class III A / I carbonate). Brown, yellow, red and grey clayey sand to clay underlies the carbonate at 70 cm.



F2 Sandy loam over poorly structured brown clay (Calcic, Mottled-Subnatic, Brown Sodosol)

Medium thickness grey brown massive loamy sand to sandy clay loam with a paler and sandier A2 layer, overlying a brown, grey and yellow heavy clay with strong blocky structure, highly calcareous from 50 cm (Class I carbonate). The carbonate grades to Blanchetown Clay at 70 cm.

G3 Thick sand over clay (Calcic, Mottled-Mesonatric, Brown Sodosol)

Thick grey sand with a strongly bleached A2 layer, overlying a yellow brown, brown and red mottled sandy clay with coarse columnar structure, more clayey with depth. Highly calcareous Class I carbonate at 80 cm.

G4a Sand over poorly structured clay (Calcic, Mottled-Mesonatric, Brown Sodosol)

Medium thickness brown sand to light sandy clay loam with a bleached A2 layer, sharply overlying a yellow, grey, brown and red mottled clay with strong columnar structure, grading to a highly calcareous Class I carbonate layer at 45 cm. This grades to a non calcareous sandy clay to heavy clay with depth.

G4b Sand over poorly structured clay with rubble (Supracalcic, Subnatic, Brown Sodosol)

Medium thickness brown sand with a thin bleached A2 layer, overlying a brown and red columnar sandy clay becoming more clayey with depth, grading to a very highly calcareous pale brown clayey sand to sandy clay with up to 50% carbonate nodules, underlain by a brown, yellow, grey and red sandy clay from 70 cm.

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

