

SAD Sandalwood Land System

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

Area: 319.3 km²

Annual rainfall: 300 - 350 mm average

Geology: The geology of the land system is complicated by the depositional and erosional events which have shaped it. Underlying the entire area are Tertiary sediments of mainly Loxton / Parilla Sands, veneered in places by Blanchetown Clay equivalent. These sediments were apparently mantled by calcrete which formed a plain of sheet rock across the landscape. This sheet has subsequently been partly eroded and / or dissolved away, leaving isolated benches of calcrete, separated by flats and depressions underlain by the older Tertiary sediments. More recently there have been aeolian accessions of:

- highly calcareous medium textured Woorinen Formation sediments (parts of which have subsequently hardened into rubbly forms), and
- Molineaux Sand. These two materials are sporadically distributed over the pre-existing landscape.

Topography: The striking feature of the land system is its strongly undulating nature. Broad depressions (solution hollows) alternate with flat topped stony rises (remnant calcrete benches), gently undulating rises (Woorinen Formation) and dunefields of low to moderate sandhills (Molineaux Sand). The sandhills are rounded with a general east-west orientation, and are superimposed over all of the other components of the System.

Elevation: 45 - 95 m

Relief: 5 - 40 m

Soils: Calcareous sandy loams and deep sands characteristic, limited areas of texture contrast soils.

Main soils:

Slopes
A4/C1 Deep calcareous sandy loam

Sandhills
H2 Deep sand

Stony ridges
A4/B2 Shallow calcareous sandy loam

Flats
D2 Sandy loam over red sandy clay

Main features: The Sandalwood Land System is a complex landscape comprising several contrasting facets. Gently undulating rises are most common, and consist of mainly moderately shallow calcareous sandy loams which are potentially productive except where excessive rubble contents limit moisture holding capacity. There are extensive flats and depressions with mainly moderately deep and fertile loamy soils with good productive potential. The less productive areas include significant areas of sandhills characterized by deep, infertile, water repellent and erosion prone sands, and stony benches, some of which have soils which are too shallow and rocky for cultivated agriculture. There are extensive areas where the pattern is a complex of sandhills and shallow stony soils which are individually poor and collectively difficult to manage.



Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Sandalwood Land System

SLU	% of area	Main features #
HkA HpA	5.7 12.8	Flats underlain by Loxton Sands, with 10-20% low sandy loam rises (Woorinen Formation residuals), and up to 30% low sandhills of Molineaux Sand. HkA Flats with less than 10% low sandhills. HpA Flats with 10-30% low sandhills. Main soils: <u>sandy loam over red sandy clay</u> - D2 (V), with <u>deep calcareous sandy loam</u> - A4/C1 (L) on non sandy rises and <u>deep sand</u> - H2 (M-C) on low sandhills. The texture contrast soils are moderately deep inherently fertile soils with high productive potential. The lighter textured forms have slight wind erosion potential, and some types may have root zones restricted by high pH or Class I carbonates at moderately shallow depths. The calcareous soils of the rises are also favourable soils - they are better structured than the texture contrast soils, but where their rubble contents increase, moisture availability is reduced. The sandhills have low fertility coarse textured soils prone to wind erosion and water repellence.
QJZ QOZ	5.8 18.4	Benches, ridges and knobs of residual calcrete capping. There is extensive surface stone. Up to 30% low sandhills overlie the land surface. QJZ Benches, ridges and knobs with less than 10% low sandhills. QOZ Benches, ridges and knobs with 10-30% low sandhills. Main soils: <u>shallow calcareous sandy loam</u> - A4/B2 (V), with <u>deep sand</u> - H2 (M-C) on sandhills. The shallow soils have restricted water holding capacities, and in places shallow soil depth and surface stone preclude cultivation. The sandhills are also marginal agricultural soils due to low fertility and susceptibility to water repellence and wind erosion. The two contrasting and marginal soil types are difficult to manage and overall productive potential is low.
STB SUB	4.2 38.4	Slopes and rises formed on highly calcareous rubbly Woorinen Formation carbonates. The land surface is overlain by up to 30% low sandhills. STB Slopes with less than 10% low sandhills. SUB Slopes with 10-30% low sandhills. Main soils: <u>deep calcareous sandy loam</u> - A4/C1 (V), with <u>deep sand</u> - H2 (M-C) on sandhills. The calcareous sandy loams are moderately productive soils, generally with adequate root zone depth and moderate fertility, although high rubble contents in some soils reduce water holding capacity. The sandy soils have several limitations (as indicated below) reducing their productive capacity.
UJG UJJ	2.4 2.1	Dunefields of more or less parallel sandhills overlying more extensive calcrete benches (QJZ/QOZ). UJG 60-90% low sandhills. UJJ 30-60% low sandhills. Main soils: <u>deep sand</u> - H2 (E-V) on sandhills, with <u>shallow calcareous sandy loam</u> - A4/B2 (E) and <u>deep calcareous sandy loam</u> - A4/C1 (L) between the sandhills. These areas are characterized by infertile, water repellent and wind erosion prone sands alternating with shallow stony sandy loams. These two soils have significant limitations as indicated above. The combination is difficult to manage for cropping and productive potential is low.
UJb UJc UJf	3.1 1.0 6.1	Dunefields of roughly parallel east-west sandhills overlying the slopes of STB/SUB . UJb 60-90% moderate sandhills. UJc 60-90% low sandhills. UJf 30-60% low sandhills. Main soils: <u>deep sand</u> - H2 (E-V) on sandhills, with <u>deep calcareous sandy loam</u> - A4/C1 (L-C) and <u>sandy loam over red sandy clay</u> - D2 (L-C) on intervening slopes and flats. The predominantly sandy soils are naturally infertile and are prone to water repellence and wind erosion. The low sandhills are arable provided that appropriate soil conservation measures are adopted. The moderate sandhills are marginal agricultural soils and may not be able to be safely cropped with the rest of the paddock (ie often only suited to barley or cereal rye). The soils of the slopes and flats are as for HkA and STB (above).

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/B2** Shallow calcareous sandy loam (Regolithic / Petrocalcic, Lithocalcic Calcarosol)

Thin to medium thickness calcareous sandy loam over rubbly calcrete, becoming softer with depth and grading to Loxton Sand at about 100 cm.

A4/C1 Deep calcareous sandy loam

(Hypercalcic / Supracalcic, Epibasic Calcarosol OR Hypercalcic / Supracalcic, Red Kandosol)

Sandy loam, calcareous within 20 cm of the surface, becoming more clayey and calcareous with depth over Class III B carbonate nodules from about 30 cm, grading to Loxton Sand from about 110 cm.

D2 Sandy loam over red sandy clay (Calcic, Red Chromosol)

Medium thickness sandy loam abruptly overlying a red sandy clay with soft carbonate from about 60 cm, grading to Loxton Sand from about 100 cm.

H2 Deep sand (Basic, Arenic / Regolithic, Brown-Orthic Tenosol)

Brown loose sand becoming paler coloured with depth over an orange loamy sand to sandy loam from about 65 cm.

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

