

WAB Wanbi Land System

(Based on the description by Potter, Wetherby and Chittleborough (1973) in "A Description of the Land in County Albert, County Alfred and Part of County Eyre, South Australia". Dept. of Agric. S.A. Soil Cons. Branch LD1).

Dunefields of low to moderate parallel sandhills extending from Hundred of Chesson to Hundred of McGorrey.

Area: 934.8 km²

Annual rainfall: 275 - 325 mm average

Geology: The land is underlain by Loxton / Parilla Sand, intermittently veneered by Blanchetown Clay equivalent. These sediments are in turn overlain by rubbly calcretes, most of which have been eroded and / or dissolved away. Overlying this land surface are deposits of highly calcareous Woorinen Formation materials which are medium grained and commonly hardened to rubbly forms. Molineaux Sand has been deposited over the top again and reworked into the characteristic parallel Wanbi sandhill system.

Topography: Closely spaced east - west parallel sandhills are the characteristic feature of the Wanbi Land System. These dunefields occupy over three quarters of the land surface. The rest of the area comprises broad flats and gently undulating rises with some isolated benches of remnant calcrete. A striking feature of the System is the series of parallel NW - SE oriented trenches (probably solution depressions) cutting across the grain of the sandhills.

Elevation: 45 - 75 m

Relief: Up to 10 m

Soils: The soils of the flats include calcareous sandy loams, with non calcareous gradational and texture contrast profiles. Sandy soils, both deep and moderately shallow over clay characterize the sandhills.

Main soils: *Sandhills and sandy flats*
H2a Deep sand
H2b Deep slightly calcareous sand
Flats and depressions
A4 Rubbly calcareous loamy sand
A4/B2 Calcareous sandy loam over calcrete

Minor soils: *Sandhills and sandy flats*
G1a Loamy sand over red sandy clay loam
G3 Thick sand over sandy clay
Flats and depressions
A4/C1 Gradational red sandy loam
D5 Loamy sand over red clay
G1b Sand over red sandy clay
B3 Shallow gradational red sandy loam
A5 Calcareous sandy loam over clay
Calcrete benches
B2 Shallow calcareous sandy loam

Main features: The Wanbi Land System is characterized by very extensive tracts of closely spaced parallel low to moderate sandhills with erodible, low fertility sandy soils not generally suited to cropping under the same management system as the swales which are dominated by moderately shallow calcareous sandy loams. This creates management difficulties. Other



significant features of the land system are broad flats and rises of calcareous soils with limited waterholding capacity, stony rises with very shallow soils and elongate depressions with deeper and potentially highly productive sandy loams.

Soil Landscape Unit summary: 10 Soil Landscape Units (SLUs) mapped in the Wanbi Land System

SLU	% of area	Main features #
HgE	3.5	Broad elongate depressions, up to 15 m below the main land surface and often edged by low calcrete cliffs. Main soils: <u>sand over red sandy clay loam</u> - G1b (E) and <u>shallow gradational sandy loam</u> - B3 (E) with <u>rubbly calcareous sandy loam</u> A4 (C) and <u>calcareous sandy loam over clay</u> - A5 (L). These soils are shallow to moderately deep, with consequent variable moisture holding capacities, but they are inherently fertile and potentially productive.
QJA QcA	1.0 1.1	Remnant calcrete benches with abundant surface stone and occasional sheet rock at the surface. The benches are sporadically overlain by low rounded sandhills. QJA Benches with less than 10% low sandhills. QcA Benches with 10-30% low sandhills. Main soils: <u>shallow calcareous sandy loam</u> - B2 (V), with <u>deep sand</u> - H2a (M-C) on sandhills. The calcareous soils are shallow and stony. They are sometimes non arable and at best have limited productive potential due to their shallow depth. The associated sandhills are have low productive potential due to low fertility and wind erosion susceptibility.
SdA	6.4	Very gently undulating flats with minor low sandhills. Main soils: <u>rubbly calcareous sandy loam</u> - A4 (E), and <u>calcareous sandy loam over calcrete</u> - A4/B2 (E) with <u>shallow gradational red sandy loam</u> - B3 (L), <u>gradational red sandy loam</u> - A4/C1 (L) and <u>loamy sand over red clay</u> - D5 (L). The capacity of these soils is generally limited by shallow depth over dense carbonate or clay, and associated restricted moisture holding capacity.
SfA SfB	6.0 4.4	Gently undulating flats and rises with 10-30% low rounded sandhills. SfA Flats. SfB Rises. Main soils: <u>deep sand</u> - H2a (C) on sandhills, and <u>rubbly calcareous sandy loam</u> - A4 (E) and <u>calcareous sandy loam over calcrete</u> - A4/B2 (E) with <u>shallow gradational red sandy loam</u> - B3 (L), <u>gradational red sandy loam</u> - A4/C1 (L) and <u>loamy sand over red clay</u> - D5 (L) on flats and rises. This land is similar to SdA , but with sandhills. The flats and rises are reasonably productive, but limited by shallow soil depth, while the sandhills have low fertility erosion prone soils.
UCJ	0.9	Dunefields of Molineaux Sand draped over the main landscape. The dunes are low, mostly parallel, and evenly spaced between 200 and 500 m apart. They occupy 30-60% of the land area. Main soils: <u>deep slightly calcareous sand</u> - H2b (E) and <u>thick sand over sandy clay</u> - G3 (L) on sand ridges, with <u>rubbly calcareous sandy clay loam</u> - A4 (E) on flats between the ridges. The main features of this landscape are low fertility erosion prone sands on the ridges, and moderately shallow calcareous sandy loams with limited waterholding capacity on the intervening flats.
UMF UMI UMJ	3.3 63.9 9.5	Dunefields of Molineaux Sand draped over the main landscape. The sandhills are generally low, rounded and parallel with east-west orientation. There are minor areas of moderate jumbled dunes. UMF 60-90% moderate jumbled dunes. UMI About 50% moderate to low parallel sandhills with gently undulating swales. UMJ 30-50% low sandhills with gently undulating swales. Main soils: <u>deep sand</u> - H2a (E-V) with <u>deep slightly calcareous sand</u> - H2b (L), <u>thick sand over sandy clay</u> - G3 (L) and <u>sand over red sandy clay loam</u> - G1a (L) on sandhills, and <u>rubbly calcareous sandy loam</u> - A4 (E) and <u>calcareous sandy loam over calcrete</u> - A4/B2 (E) with <u>shallow gradational red sandy loam</u> - B3 (M-L) and <u>gradational red sandy loam</u> - A4/C1 (L) in swales. The characteristic feature of the Wanbi sandhills is the regular and close spacing of the sandhills. They are generally not suited to cropping with the rest of the paddock because of the degree of erosion susceptibility, and are too frequent to fence out. Management is consequently difficult. This also has implications for any irrigated uses. The swales are similar to SdA , having calcareous sandy loams with limited waterholding capacity.



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** Rubbly calcareous loamy sand (Regolithic, Supracalcic Calcarosol)
Medium to thick loamy sand to sandy loam becoming more calcareous and clayey with depth over Class III B to III C carbonate rubble in a light brown sandy clay loam matrix, rubble content decreasing with depth and continuing below 100 cm, over heavy clay within 150 cm.
- A4/B2** Calcareous sandy loam over calcrete (Regolithic/Petrocalcic, Lithocalcic Calcarosol)
Medium thickness calcareous loamy sand to sandy loam grading to a highly calcareous rubbly light sandy clay loam over calcrete within 50 cm.
- A4/C1** Gradational red sandy loam (Hypercalcic / Supracalcic Red Kandosol / Calcarosol)
Sandy loam becoming more clayey and calcareous with depth, over a very highly calcareous brown light clay within 40 cm, grading to Parilla Sand below 100 cm.
- A5** Calcareous sandy loam over clay (Regolithic, Lithocalcic Calcarosol)
Medium to thick calcareous sandy loam over Class III C carbonate rubble in a sandy clay loam matrix, grading to Tertiary clay within 100 cm.
- B2** Shallow calcareous sandy loam (Petrocalcic, Calcic Calcarosol)
Medium thickness sandy loam over a calcareous light sandy clay loam with abundant calcrete rubble, on calcrete as shallow as 10 cm. Calcrete grades to a very highly calcareous sandy clay loam continuing below 100 cm, with Blanchetown Clay at depth.
- B3** Shallow gradational red sandy loam (Petrocalcic, Red Kandosol)
Thin sandy loam grading to a red light sandy clay loam over rubbly calcrete at about 20 cm, gradually becoming less rubbly and overlying Blanchetown Clay within 200 cm. Lower flats.
- D5** Loamy sand over red clay (Hypercalcic, Red Sodosol)
Medium thickness loamy sand, over a coarsely structured red sandy clay to light clay, very highly calcareous from about 50 cm, grading to clay within 100 cm.
- G1a** Loamy sand over red sandy clay loam (Calcic, Red Sodosol / Kandosol)
Medium to thick loamy sand to sand overlying a red sandy loam to sandy clay loam, with soft carbonate from about 50 cm, becoming sandier with depth over Parilla Sand or buried soils from about 100 cm.
- G1b** Sand over red sandy clay (Calcic, Red Sodosol)
Medium thickness sand to loamy sand overlying a red sandy clay loam to sandy clay, with soft carbonate from about 50 cm, becoming sandier with depth over Parilla Sand from about 100 cm.
- G3** Thick sand over sandy clay (Hypercalcic, Red Sodosol)
Thick to very thick sand to loamy sand over a coarsely structured red to brown sandy clay, calcareous with depth, grading to Tertiary clay.
- H2a** Deep sand (Calcareous, Arenic, Red-Orthic Tenosol)
100-150 cm sand to loamy sand, calcareous from about 70 cm, grading to a brown highly calcareous sandy clay loam.
- H2b** Deep slightly calcareous sand (Regolithic, Calcic Calcarosol)
Very thick reddish slightly calcareous sand, with segregations of soft carbonate at variable depth depending on erosional history. Usually sandy for several metres.

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

