

# AVA Avalon Land System

Gently undulating plain south of Cambrai

**Area:** 100.6 km<sup>2</sup>

**Annual rainfall:** 295 – 380 mm average

**Geology:** The System is underlain by Blanchetown Clay, which is near the surface in depressions. The clay is overlain by calcrete or rubbly to soft carbonates of the Woorinen Formation. There are limited areas of windblown Molineaux Sand deposits over the calcareous materials.

**Topography:** The landscape is very gently undulating. In the west is a gently inclined calcrete rise, but towards the east the landscape flattens to a pattern of very gently undulating rises and flats, overlain in places by low to moderate linear sandhills or sand spreads. There are minor depressions where the calcrete has been at least partly eroded or dissolved to expose the older clays.

**Elevation:** 80 m in the east to 170 m in the west

**Relief:** Up to 10 m

**Typical soils:** There are four distinctive broad soil classes, viz. calcareous sandy loam, shallow stony soil on calcrete, sandy soils, and loam over clay soils.

## Main soils

### *Undulating flats and rises*

**A4/A5a** Rubbly calcareous loamy sand over heavy clay

**A4/A5b** Non rubbly calcareous sandy loam over heavy clay

### *Calcrete rises*

**B2/B3** Shallow stony sandy loam

### *Sandy flats and sand rises*

**G1** Sand over sandy clay loam

## Minor soils

### *Sandy rises*

**H2** Deep sand over calcrete

### *Loamy flat*

**D2/D3** Sandy loam over red clay

**Main features:** The Avalon Land System comprises four distinctive components. Most extensive are very gently undulating flats and rises with mainly rubbly and non rubbly calcareous loamy sands to sandy loams. These are fully arable but have sub-optimal water holding capacity and fertility. Sandhills and sand spreads are dominated by moderately deep to deep sandy soils with low fertility and moderate susceptibility to wind erosion. The depressions have deep and fertile soils, but they are too heavy for the rainfall in dry seasons. Boron toxicity and salinity may limit productivity as well. A broad stony rise in the west is arable but soils are very shallow and droughty.



**Soil Landscape Unit summary:** 6 Soil Landscape Units (SLUs) mapped in the Avalon Land System:

SLU	% of area	Main features #
GJA	4.5	Depressions underlain by Blanchetown Clay at shallow depth.  Main soils: <u>sand over sandy clay loam - G1</u> (E) and <u>sandy loam over red clay - D2/D3</u> (E). These soils are deep with low (G1) to moderate (D2/D3) fertility and moderate to high productivity potential. However, the loamier types may be too heavy for the rainfall, resulting in moisture stress in dry finishes. Boron toxicity and moderate subsoil salinity are also probable limitations.
QMB	12.0	Low stony rises formed on calcrete. There is 20-50% surface calcrete stone and some sheet rock at the surface.  Main soil: <u>shallow stony sandy loam - B2/B3</u> (D). Although this land is mostly arable, the shallow stony soils have restricted water holding capacity and the rocks are hard on implements. Natural fertility is moderately low.
SVA	54.6	Very gently undulating plains underlain by Blanchetown Clay. There is variable surface calcrete; 20-50% on stony rises, to nil on sandy flats and rises.  Main soils: <u>rubbly calcareous loamy sand - A4/A5a</u> (E) and <u>calcareous sandy loam - A4/A5b</u> (C) throughout, with <u>shallow stony sandy loam - B2/B3</u> (L) on stony rises, <u>sand over sandy clay loam - G1</u> (L) and <u>deep sand over calcrete - H2</u> (M) on sandy rises and flats, and <u>sandy loam over red clay - D2/D3</u> (M) in depressions. This land is fully arable, productivity of the main soils being limited to some degree by water holding capacity and fertility. The sandy soils are very infertile and susceptible to wind erosion, while the stony soils are marginal for cropping due to low water holding capacity. The heavier soils in the depressions are similar to those in GJA.
U-C UAI UAK	1.3 23.8 3.8	Low to moderate linear sandhills, and sand spreads with up to one and a half metres of sand over clay or calcrete.  <b>U-C</b> Low to moderate linear sandhills. <b>UAI</b> 30-60% low to moderate sandhills with intervening gently undulating flats. <b>UAK</b> Gently undulating sand spreads.  Main soils: <u>sand over sandy clay loam - G1</u> (E) and <u>deep sand over calcrete - H2</u> (E) on sandhills, sandy rises, sandy flats and sandspreads, with <u>calcareous sandy loam - A4/A5b</u> (L) and <u>rubbly calcareous loamy sand - A4/A5a</u> (M) on non sandy flats. The sandy soils are infertile, and prone to water repellence and wind erosion. The soils of the flats are as for SVA.

# 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:***Undulating flats and rises*

- A4/A5a** Rubbly calcareous loamy sand (Supracalcic / Lithocalcic Calcarosol)  
Calcareous loamy sand becoming more clayey and calcareous with depth over Class III B or III C carbonate rubble from about 30 cm, becoming less rubbly with depth with increasing clay content, grading to Blanchetown Clay usually below 100 cm, but as shallow as 65 cm.
- A4/A5b** Calcareous sandy loam (Hypercalcic Calcarosol)  
Calcareous loamy sand to sandy loam becoming more clayey and calcareous with depth over a very highly calcareous Class III A carbonate layer from about 45 cm, over Blanchetown Clay at depths ranging from 65 cm to below 100 cm.

*Calcrete rises*

- B2/B3** Shallow stony sandy loam (Ceteric / Epibasic, Petrocalcic, Lithocalcic Calcarosol)  
Sandy loam (calcareous to non calcareous) with variable rubble content over sheet calcrete at about 35 cm.

*Sandy flats and sand rises*

- G1** Sand over sandy clay loam (Calcic, Red Chromosol / Sodosol)  
Medium to very thick sand to loamy sand over a red (or brown) sandy clay loam, calcareous with depth, over variable thickness layers of sandy or calcareous material, grading to Blanchetown Clay at depths ranging from 70 cm to more than 200 cm.
- H2** Deep sand over calcrete (Petrocalcic, Red-Orthic Tenosol)  
Very thick loose sand, paler coloured with depth over rubble or calcrete at depths ranging from 60 to 120 cm.

*Loamy flats*

- D2/D3** Sandy loam over red clay (Loamy Calcic, Red Chromosol / Sodosol)  
Medium thickness sandy loam abruptly overlying a red well structured (D2) to poorly structured (D3) clay, calcareous from about 35 cm, grading to Blanchetown Clay from about 65 cm.

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

