AYR   Ayres Land System

Flats and low rises along the western side of Bald Hill Range

Area: 53.5 km²

Annual rainfall: 440 – 495 mm average

Geology: The Land System is formed on siltstones and fine sandstones of the Tapley Hill Formation, which are near the surface on rising ground, but which are extensively covered by clayey alluvium on outwash fans and valley floors. All materials are sporadically mantled by fine aeolian carbonates.

Topography: The Ayres Land System is a north - south trending strip of gently sloping land flanked along its eastern side by the Bald Hill Range. Except for a small watershed draining eastward through this range into Mt. Bryan Creek, all water courses flow in a westerly direction through the strongly dissected slopes of the Leighton Land System. The overall gradient across the land system is from east to west. Low rises formed on basement rocks occupy most of the area. These are less than 30 m high and have slopes of less than 10%. Between the rises are gently inclined to flat outwash fans with slopes of less than 3%. In the headwaters of the east flowing water course are two old salt lakes surrounded by salt affected land.

Elevation: 550 m in the north to 450 m in the south

Relief: Maximum relief is 30 m

Soils: Hard red texture contrast soils are typical, with shallow stony soils and cracking clays.

Main soils
Rises
D1   Hard sandy loam over red clay on rock
Fans and flats
D3   Hard loam over dispersive clay

Minor soils
Fans and flats
C3   Gradational loam
E2   Cracking clay
Rises
D7   Hard sandy loam over dispersive red clay on rock
L1   Shallow stony loam

Main features: The Ayres Land System is undulating to flat with moderately deep to deep sandy loam soils, generally with red clay subsoils. Poor surface structure is the main agricultural limitation, through its effect on increasing runoff and erosion, making seedbed preparation difficult, and impeding emergence and vigorous root growth. Sporadic salinity on lower lying ground where drainage is impeded is an additional problem. Modifications to surface management to improve soil structure should have the dual benefits of increasing productivity and water use efficiency, thereby helping to alleviate the salinity problem.

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

SLU	% of area	Main features #
DIB DIC	17.7 29.0	Low rises formed on siltstones and fine sandstones of the Tapley Hill Formation. There is a variable amount of surface sandstone and quartzite, up to 30%. Rocky outcrops are sporadic, less than 1% overall. **DIB** Low rises to 10 m high with slopes of 1-3% **DIC** Rises to 30 m high with slopes of 3-10% Main soils: <u>hard sandy loam over red clay on rock</u> - **D1** (V), with <u>hard sandy loam over dispersive red clay on rock</u> - **D7** (C). These soils are moderately fertile and usually have sufficient depth to store adequate moisture. Their main drawback is poor structure, particularly of the surface which seals over and sets hard. This leads to excessive runoff and erosion, limited opportunities for effective working, and patchy emergence in some seasons. Modifications to surface management and the use of gypsum will help improve soil structure and reduce erosion.
ESC	2.8	Rises to 20 m high with slopes of 4-10%. There is 5-10% coverage of rocky outcrop, and up to 30% surface stone. Main soils: <u>hard sandy loam over red clay on rock</u> - **D1** (E) and <u>shallow stony loam</u> - **L1** (E). This land is similar to **DIC**, but with more rocky reefs and shallower soils, and consequent lower productive capacity.
JCL JCP	34.3 13.2	Outwash fans and flats formed on fine grained alluvium, and variably affected by saline seepage. **JCL** Very gently inclined fans with slopes of 1-3% and minor saline seepage. **JCP** Flats with slopes of less than 1% and most of the land affected by marginal salinity. Main soils: <u>hard loam over dispersive clay</u> - **D3** (V) with <u>cracking clay</u> - **E2** (C) and <u>gradational loam</u> - **C3** (L). The dominant soils are deep and moderately fertile, but poorly structured. Hard setting surface soils cause excessive runoff, are difficult to work and affect emergence. The dispersive subsoils cause perched water tables to develop, resulting in seasonal waterlogging. These conditions not only reduce productivity on site, but contribute to salinization downslope. Subsoil salinity and sodicity are likely causes of yield reductions across much of the area
VZ-	3.0	Old salt lakes, inundated in wet seasons.

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:

C3 Gradational loam (Hypercalcic / Calcic, Red Dermosol)
Medium thickness loam to clay loam grading to a well structured red clay, calcareous with depth.

D1 Hard sandy loam over red clay on rock (Red Chromosol)
Medium thickness hard gravelly sandy loam to clay loam abruptly overlying a well structured red clay grading to weathering siltstone or fine sandstone within 50 cm. There is fine carbonate at the soil - rock interface in about 50% of profiles.

D3 Hard loam over dispersive clay (Red Sodosol)
Thick hard sandy loam to loam abruptly overlying a red coarsely structured dispersive clay with minor carbonate at depth.

D7 Hard sandy loam over dispersive red clay on rock (Calcic, Red Sodosol)
Medium thickness hard setting sandy loam to sandy clay loam abruptly overlying a coarsely structured dispersive red clay, with fine carbonate accumulations at depth, grading to weathering quartzitic rock from about 100 cm.

E2 Cracking clay (Vertosol)
Brown clay with blocky structure grading to a red heavy clay with soft carbonate at depth. Cracks to the surface when dry.

L1 Shallow stony loam (Lithic, Leptic Tenosol)
Medium thickness stony loam directly overlying rock.

Further information: DEWNR Soil and Land Program

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