

# BOL Booleroo Land System

Undulating rises between Booleroo Centre and Appila

- Area:** 132.4 km<sup>2</sup>
- Annual rainfall:** 400 – 470 mm average
- Geology:** Siltstones, sandstones and quartzites of the Saddleworth, Rhynie and Cradock Formations, and associated locally derived medium to fine grained alluvium.
- Topography:** Undulating rises formed on basement rock, and gently sloping to level pediments and plains formed on outwash sediments derived from the rising ground. The Land System includes the upper catchment of Rocky River Creek (flowing south) and a small part of the upper catchment of Rotten Creek (flowing north west). Slopes range from 1% in the Rocky River Creek flats to 10% on the steepest of the rising ground.
- Elevation:** 340 m on the Rocky River Creek flats to 450 m on the rising ground to the east
- Relief:** Maximum relief is 40 m, and usually less than 30 m
- Soils:** Most soils are sandy loam texture contrast soils with clayey subsoils which are commonly dispersive. Gradational calcareous and non calcareous loams make up most of the other soils.

## Main soils

### *Soils formed on rises*

- A2** Shallow calcareous loam  
**D1** Hard loam over red clay on rock  
**C2a** Shallow loam over red clay with rubble  
*Soils formed on alluvium or deeply weathered rock*  
**C3** Gradational loam  
**D3** Hard loam over poorly structured red clay

## Minor soils

### *Soils formed on lower slopes and flats on alluvium or deeply weathered rock*

- A5** Deep calcareous loam  
**D2** Hard loam over red clay  
**D3/D7** Hard sandy loam over poorly structured red clay on deeply weathered rock  
**M2** Deep gradational loam

### *Soils formed on basement rock rises*

- C2b** Scalded gradational loam  
**D7** Hard sandy loam over dispersive clay on rock  
**L1** Shallow stony loam

- Main features:** The Booleroo Land System is an almost fully arable undulating landscape characterized by texture contrast soils. Many of these are poorly structured, with hard setting sandy loam surfaces and dispersive subsoils. These properties are associated with excessive runoff and erosion, poor workability, impeded root growth and reduced waterholding capacity. Modified surface management practices and the use of gypsum can help to alleviate the problem. Other soils include better structured loam over clay profiles, gradational loams and calcareous loams. These are often shallow but fertile and easy to manage. Control of erosion is an important management consideration.



**Soil Landscape Unit summary:** 13 Soil Landscape Units (SLUs) mapped in the Booleroo Land System:

SLU	% of area	Main features #
DDB DDC	6.6 18.7	Rises formed on fine grained rocks. <b>DDB</b> Slopes of 1-3%. <b>DDC</b> Slopes of 3-10%. Main soils: <u>hard loam over red clay on rock - D1 (E)</u> , with <u>shallow loam over red clay with rubble - C2a (C)</u> , <u>hard sandy loam over dispersive clay on rock or deeply weathered rock - D7 or D3/D7 (L)</u> , <u>shallow calcareous loam - A2 (L)</u> and <u>scalded gradational loam - C2b (M)</u> . The land is fully arable with soil structural problems and erosion potential being the main limitations. The most common soils have hard setting surfaces and often have dispersive subsoils which adversely affect water penetration, seedling emergence and workability. The more calcareous soils (C2a and A2) have more favourable physical properties.
DKB DKC	5.1 3.0	Rises formed on coarse grained rocks. <b>DKB</b> Slopes of 2-4%. <b>DKC</b> Slopes of 4-10%. Main soils: <u>hard sandy loam over dispersive clay on rock or deeply weathered rock - D7 or D3/D7 (E)</u> , with <u>shallow loam over red clay with rubble - C2a (C)</u> , <u>hard loam over red clay on rock - D1 (L)</u> , <u>shallow calcareous loam - A2 (L)</u> and <u>scalded gradational loam - C2b (M)</u> . Poor soil structure leading to excessive runoff, reduced waterholding capacity, patchy emergence and erosion is a feature of many soils, especially <b>D7</b> and <b>D3/D7</b> , in this landscape. Sandy and quartzitic surfaces cause accelerated implement abrasion. The more calcareous soils ( <b>C2a</b> and <b>A2</b> ) have more favourable properties.
EGB EGC	19.1 4.0	Rises formed on fine grained rock. <b>EGB</b> Slopes of 2-4%. <b>EGC</b> Slopes of 4-10% Main soils: <u>shallow calcareous loam - A2 (E)</u> , with <u>hard loam over red clay on rock - D1 (C)</u> , <u>shallow loam over red clay with rubble - C2a (L)</u> and <u>shallow stony loam - L1 (L)</u> . This landscape is arable although many soils are shallow over carbonate layers or rock and prone to rapid moisture depletion. Alkalinity of the calcareous <b>A2</b> soils and associated nutrient fixation affects fertility. The deeper <b>D1</b> and <b>C2a</b> soils are fertile and potentially productive soils provided erosion is controlled.
ESC ESD	0.7 0.5	Semi arable rises on basement rock. <b>ESC</b> Rises with slopes of 5-15%. <b>ESD</b> Rocky rises with slopes of 10-20%. Main soils: <u>shallow calcareous loam - A2 (E)</u> and <u>shallow loam over red clay with rubble - C2a (E)</u> , with <u>shallow stony loam - L1 (C)</u> . Rocky reefs and associated shallow soils between the outcrops restrict the cropping productivity of this landscape.
JDB JDF JDJ	10.6 7.0 1.3	Lower slopes and flats formed on fine grained alluvium. <b>JDB</b> Gentle slopes of 2-4%. <b>JDF</b> Flats with eroded watercourses. <b>JDJ</b> Eroded drainage depressions. Main soils: <u>hard loam over poorly structured red clay - D3 (E)</u> and <u>hard loam over red clay - D2 (E)</u> , with <u>deep gradational loam - M2 (L)</u> , <u>loam over red clay with rubble - C3 (M)</u> and <u>deep calcareous loam - A5 (M)</u> . The land is potentially productive with deep, inherently fertile soils. The main limitation is the adverse physical condition of the most common soil ( <b>D3</b> ). Hard setting surfaces and dispersive subsoils cause excessive runoff (contributing to erosion), patchy emergence and restricted workability. Poor root growth in poorly structured soils can result in low water use efficiency. The <b>D2</b> soils have similar but less severe characteristics and the less common <b>C3</b> and <b>A5</b> soils are well structured. Erosion in watercourses and sporadic salinity are minor problems.
KDB KDE	22.0 1.4	Flats and gentle slopes formed on fine grained alluvium. <b>KDB</b> Gentle slopes of 2-5%. <b>KDE</b> Drainage depressions. Main soils: <u>loam over red clay with rubble - C3 (E)</u> , with <u>hard loam over poorly structured red clay - D3 (C)</u> , <u>hard loam over red clay - D2 (L)</u> and <u>deep calcareous loam - A5 (M)</u> . The soils are generally well structured (except the D3 soils) and fertile, but often with limited water holding capacity. Erosion is usually not a problem (except in creeks). There is sporadic saline seepage.



# 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:

- A2** Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)  
Calcareous, often stony, sandy loam to sandy clay loam over Class III A, B or C carbonate grading to weathering rock within a metre.
- A5** Deep calcareous loam (Pedal, Hypercalcic / Lithocalcic Calcarosol)  
Calcareous loam to clay loam grading to a well structured clayey subsoil with a layer of rubbly or soft carbonate over alluvium.
- C2a** Shallow loam over red clay with rubble (Supracalcic, Red Chromosol / Dermosol)  
Loam over a well structured red clay with rubbly carbonate at shallow depth over weathering fine grained rock within 100 cm.
- C2b** Scalded gradational loam (Sodic, Calcic, Red Dermosol)  
Medium thickness to thin (depending on degree of soil loss) saline sandy loam to clay loam grading to a well structured red clayey subsoil with fine to rubbly carbonate at moderately shallow depth, overlying weathering rock.
- C3** Gradational loam (Supracalcic / Lithocalcic, Red Dermosol)  
Friable loam to clay loam grading to a well structured red clay with rubbly or soft carbonate at moderately shallow depth over alluvium.
- D1** Hard loam over red clay on rock (Calcic / Hypercalcic, Red Chromosol)  
Hard loam to clay loam abruptly overlying a well structured red clay with soft Class I carbonate over weathering rock by 100 cm.
- D2** Hard loam over red clay (Calcic, Red Chromosol)  
Hard sandy loam to clay loam abruptly overlying a well structured red clay with soft carbonate at depth, grading to alluvium below 100 cm.
- D3** Hard loam over poorly structured red clay (Calcic, Red Sodosol)  
Hard sandy loam to clay loam abruptly overlying a coarsely structured and dispersive red clay with soft carbonate at depth, grading to alluvium below 100 cm.
- D3/D7** Hard sandy loam over dispersive red clay on deeply weathered rock (Hypercalcic, Red Sodosol)  
Hard sandy loam to clay loam abruptly overlying a coarsely structured and dispersive red clay with soft carbonate at depth, grading to deeply weathered rock below 100 cm.
- D7** Hard sandy loam over dispersive clay on rock (Calcic / Supracalcic, Red Sodosol)  
Hard setting sandy loam to clay loam sharply overlying a poorly structured dispersive red clay grading to soft or rubbly carbonate over weathering sandstone (sandy loam soils) or siltstone (loam and clay loam soils).
- L1** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)  
Shallow stony loam over weathering rock with carbonate accumulations.
- M2** Deep gradational loam (Calcic / Hypercalcic, Red Dermosol)  
Loam to clay loam grading to a well structured red clay, calcareous at depth over alluvium.

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

