SMI Smithfield Land System

Gentle slopes between Elizabeth and Gawler

Area: 21.0 km^2

Annual rainfall: 450 – 525 mm average

Geology: Alluvial clays of the Pooraka Formation, derived from the ranges to the east. The clays are mantled by a veneer of fine grained carbonates of aeolian origin.

Topography: The land comprises a simple outwash fan with very gentle to gentle slopes abutting the Gawler Escarpment. Slopes are 2% to 10%. Well defined watercourses enter the land system from the escarpment, but dissipate as the slope wanes.

Elevation: 150 m on the eastern side to 50 m on the western side

Relief: The land surface has a uniform westward gradient with no internal relief other than a few metres in occasional eroded water courses.

Soils: The soils are red, medium to fine grained, and calcareous with depth. The principal variations between the different soils are the degree of contrast between the surface soils and the clayey subsoil. Some soils are clay loamy to clayey throughout, others have a distinct contrast between a loamy surface and the subsoil, and others have a gradual increase in clay content with depth.

Main soils

D2	Loam over red clay
C3	Gradational red loam
C4/M2	Gradational red clay loam

Main features: The Smithfield Land System comprises gentle slopes with deep, inherently fertile and moderately well drained soils. Apart from minor limitations caused by hard setting surfaces and some poorly structured subsoils, they have high productive potential, especially for dryland crops. Drainage problems are likely in some soils under irrigation.

Soil Landscape Unit summary: 3 Soil Landscape Units (SLUs) mapped in the Smithfield Land System

SLU	% of area	Main features #
JAB JAC JAJ	37.5 58.8 3.7	Very gently to gently inclined outwash fans. **JAB** Very gently inclined fans with slopes of 2-4%. **JAC** Gently inclined fans with slopes of 4-10%. **JAJ** Eroded watercourses. The soils are deep and loamy. Main soils: Loam over red clay - **D2** (E) Gradational red loam - **C3** (E) Gradational red clay loam - **C4/M2** (E) These soils are deep and inherently fertile. They are neutral to slightly alkaline at the surface, and alkaline to strongly alkaline with depth. They are moderately well to well drained. Hard setting surfaces and coarsely structured subsoils (C4/M2 soils) are somewhat limiting in terms of infiltration rates, workability, seedling emergence and optimum root growth, but overall productive potential is high. The more clayey types (especially C4) have potential drainage problems under irrigation.

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:

D2 Loam over red clay (Sodic, Calcic, Red Chromosol)
Thick hard loamy surface soil with a paler coloured A2 horizon, overlying a dark reddish brown well structured clay subsoil, highly calcareous (Class I carbonate) from about 60 cm. The soil grades to medium to fine grained alluvium below 100 cm.

C3 Gradational red loam (Sodic, Calcic, Red Dermosol)
Medium thickness reddish brown loam, overlying a dark reddish brown clay loam with granular structure, grading to a red light clay. There is abundant soft Class I carbonate from 70 cm.

C4/M2 Gradational red clay loam (Vertic, Calcic / Eutrophic, Red Dermosol)
Thick reddish brown clay loam to light clay with granular structure, overlying a red clay with strong blocky structure and variable soft carbonate segregations (Class I carbonate) from 65 cm.

Further information: DEWNR Soil and Land Program