

MAA Malabena Land System

Undulating valley lying between two rocky ranges east of Dutton

Area: 21.7 km²

Annual rainfall: 360 – 450 mm average

Geology: The Land System is formed on mixed metagreywackes and phyllites of the Tappanappa Formation. These rocks are more weatherable than those underlying the ranges to the east and the west - hence the lower elevation of the Malabena System relative to the surrounding Cooke Hill System. There are significant areas of locally derived alluvial deposits. Both rocks and sediments are mantled by soft carbonates occurring as minor segregations in the subsoil.

Topography: The Malabena Land System is an elongate north - south valley sandwiched between rocky ranges on both sides. The valley is undulating, comprising basement rock rises to 30 m high and associated gently inclined outwash fans. In places the valley floor has been dissected by streams crossing it from west to east, to form moderately steep rocky slopes. The principal water courses are (from north to south) Stockyard Creek, Levi Creek, Pine Creek and Truro Creek. These enter the system via gorges in the range to the west, and flow out via gorges in the range to the east.

Elevation: 320 m to 230 m

Relief: Maximum relief is 40 m

Soils: Hard red sandy loam texture contrast soils, with shallow stony soils dominating the landscape.

Main soils

- D1** Hard sandy loam over friable red clay on rock - very extensive (rises)
- L1** Shallow stony sandy loam - common (steeper rocky slopes)
- D3** Hard sandy loam over dispersive red clay - limited (outwash fans)

Main features: The Malabena Land System consists of mainly undulating arable slopes with moderately deep to deep sandy loam over red clay soils characterized by hard setting surfaces. Although moderately fertile, productivity on these soils is limited by their poor structure which causes excessive runoff, workability difficulty, reduced waterholding capacity and patchy emergence and early crop growth. Amelioration of surface structure problems and control of associated erosion are the main management issues. Steeper rocky land which occupies limited areas of the Land System is suitable for rough grazing only, and maintenance of protective surface cover is essential.



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

SLU	% of area	Main features #
AKH	12.2	Rocky rises to 30 m high with slopes of 10-30% and eroded watercourses. Main soils: <u>shallow stony sandy loam</u> - L1 (V); <u>hard sandy loam over friable red clay on rock</u> - D1 (E). Land too rocky for agricultural uses other than rough grazing. Eroded watercourses need protection.
DHC	36.9	Undulating rises formed on basement rocks. Relief is 10-30 m and slopes 5-12%. There is up to 5% rock outcrop, up to 10% surface quartzite and metasandstone and minor watercourse erosion. Main soils: <u>hard sandy loam over friable red clay on rock</u> - D1 (V), with <u>shallow stony sandy loam</u> - L1 (L) on rocky areas, and <u>hard sandy loam over dispersive red clay</u> - D3 (M) on lower slopes. Soils are moderately deep with moderate natural fertility, but they usually have poorly structured hard setting surfaces, making them highly erodible, difficult to work and unfavourable for good root growth.
DZC DZH	12.6 10.6	Complex of undulating rises formed on basement rocks and outwash fans formed on locally derived outwash sediments. There is up to 10% surface quartzite and metasandstone with minor rocky outcrops on crests. DZC Relief of 10-20 m, slopes 3-8% and minor water course erosion. DZH Relief of 10-20 m, slopes of 3-7% and eroded water courses. Main soils: <u>hard sandy loam over friable red clay on rock</u> - D1 (V), with <u>hard sandy loam over dispersive red clay</u> - D3 (C) on fans and <u>shallow stony sandy loam</u> - L1 (M). These soils are moderately deep with moderate natural fertility, but they usually have poorly structured hard setting surfaces, making them highly erodible, difficult to work and unfavourable for good root growth.
ETI	14.7	Dissected slopes of 10-25%; relief to 40 m with 50% rocky land. Watercourses commonly eroded. Main soils: <u>shallow stony sandy loam</u> - L1 (E) and <u>hard sandy loam over friable red clay on rock</u> - D1 (E). This land is semi arable, with over half of the area too steep and/or rocky for cultivation. The arable strips generally have shallow stony soils with restricted waterholding capacity. They are prone to erosion because of the moderate slopes and high runoff.
JWG	13.0	Complex of outwash fans formed on locally derived outwash sediments, and undulating rises formed on basement rocks. Slopes are 2-4%, and relief is 10-20 m. There is up to 10% surface quartzite and metasandstone. Watercourses are generally eroded. Main soils: <u>hard sandy loam over dispersive red clay</u> - D3 (V) on fans; <u>hard sandy loam over friable red clay on rock</u> - D1 (C) on rises. Land mostly arable, with main soils being deep and moderately fertile. However they are poorly structured with hard setting surfaces and dispersive subsoils. This results in excessive runoff, workability problems, reduced moisture holding capacity and patchy emergence. Use of gypsum and modified surface management practices will alleviate the problem.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(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:

- D1** Hard sandy loam over friable red clay on rock (Calcic, Red Chromosol)
15 - 30 cm hard fine sandy loam to loam abruptly overlying a red well structured clay with minor soft carbonate from 60 cm grading to weathering rock at 55 cm.
- D3** Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
30 - 50 cm hard fine sandy loam to loam abruptly overlying a red coarsely structured dispersive clay with minor soft to rubbly carbonate from 65 cm, continuing below 100 cm in alluvium.
- L1** Shallow stony sandy loam (Lithic Rudosol)
Up to 40 cm stony sandy loam directly overlying basement rock.

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

