WIP Windy Plains Land System

Gently undulating slopes and plains with sand rises south west of Morchard

Area: 84.3 km^2

Annual rainfall: 325 - 375 mm average

Geology: Medium to fine grained outwash sediments with sporadic deposits of Tertiary heavy clay (Hindmarsh Clay equivalent) overlain by soft and rubbly carbonates (Woorinen Formation) and aeolian Molineaux Sand. Basement siltstones and sandstones (and a ridge of Cradock Quartzite) underlie the sediments at shallow depth.

Topography: Very gently to gently inclined outwash fans and alluvial flats flanking the western side of the Pekina Range. Low sand rises and dunes are scattered across the landscape. These have been considerably reworked since European settlement, resulting in a sandy veneer over much of the land. The slopes are underlain at shallow depth by basement rocks, usually on low rises. Quartzite residuals form rises to 40 m high with slopes of 5-15% in a north - south line through the centre of the land system.

Elevation: 330 m on the western edge, to 450 m adjacent to the range to the east

Relief: Less than 10 m relief on fans; quartzite rises are up to 40 m above the general surface

Soils: Deep loamy soils are predominant on flats and gentle slopes. These have more clayey subsoils, and may or may not be calcareous throughout. On rises, soils are shallower, and usually calcareous with sandy loam to loam surfaces with rubble, soft carbonate or weathering rock at relatively shallow depth. The distinctive sandy soils of the system occur on sandhills and sandy rises, but eroded sand from these areas often veneers other soils.

Main soils:

C3	Gradational loam - fans
A4	Calcareous sandy loam - rises
A6	Deep calcareous loam on clay- fans
H2a	Deep calcareous sand - sandy rises
H2b	Deep non calcareous sand - sandy rises

Minor soils:

Soils on outwash fans formed over alluvial sediments

D2	Loam over red clay
A5	Rubbly calcareous loam on clay
M1	Deep gravelly sandy loam

Soils on non sandy rises

B2	Calcareous sandy loam on calcrete
A2	Shallow calcareous loam
C2/D1	Loam over red clay

Main features: The Windy Plains Land System has relatively sandy soils, compared with the rest of the region. These occur on low sand dunes, but more frequently as a sandy veneer over the gently undulating landscape. The soils are infertile and prone to wind erosion. Moderately deep loamy soils, both calcareous and non calcareous, occur on the major land form (gentle slopes). These soils have only minor limitations. Basement rock rises scattered through the land have shallow, usually calcareous, and stony soils.

Soil Landscape Unit summary: 8 Soil Landscape Units (SLUs) mapped in the Windy Plains Land System

SLU	% of area	Main features #
EAC EAD	4.9 0.2	Ridges and rises formed on quartzite. Relief is up to 40 and there is up to 20% surface quartzite. **EAC** Rises with slopes of 5-15%. **EAD** Isolated moderately steep rocky crest with slopes to 20%. Main soils: shallow calcareous loam - **A2** (E)**,** calcareous sandy loam - **A4** (E) and loam over red clay - **C2/D1** (E). This land has mainly shallow soils which together with the low rainfall reduce productivity. The land is susceptible to both water and wind erosion, and the mainly alkaline soils are prone to nutrient deficiencies.
KDA KDB KDE	8.2 37.7 6.9	Outwash fans formed on fine to medium grained sediments: **KDA** Very gently inclined plain with slopes of less than 2%. **KDB** Gently inclined fan slopes of 2-4% with about 10% coverage of low sand dunes and spreads. **KDE** Drainage depressions up to 500 m wide with slopes of 2-4% and up to 10% surface quartzite. Main soils: gradational loam - **C3** (E), with loam over red clay - **D2** (C), deep calcareous loam on clay - **A6** (L), rubbly calcareous loam on clay - **A5** (M), deep sand - **H2a/H2b** (M) on sandy rises and deep gravelly sandy loam - **M1** (M) in drainage depressions. This land has moderately deep, fertile, well drained soils with slight limitations due to poor soil structure (workability, seedling emergence, runoff) and erosion potential. The overlying sandhills have moderate limitations of fertility, wind erosion susceptibility and waterholding capacity. Low rainfall is the over-riding limitation.
SUB SUC	37.7 3.8	Rises formed on rubbly carbonate of the Woorinen Formation and partly covered (less than 30%) by low dunes of Molineaux Sand. These materials in turn overlie a complex of alluvial sediments, Tertiary heavy clays and weathering basement rocks. There is up to 30% calcrete surface stone. **SUB** Gently undulating rises of 2-5%. **SUC** Undulating rises of 4-8%. Main soils: calcareous sandy loam - **A4** (E), with deep calcareous loam on clay - **A6** (L) on lower slopes, deep sand - **H2a/H2b** (L) on sand rises, calcareous sandy loam on calcrete - **B2** (L) on stony rises and shallow calcareous loam - **A2** (L) on rises where basement rock is close to the surface. The calcareous soils have minor to moderate limitations (alkalinity, fertility, erosion potential and waterholding capacity) while the sand dunes have moderate limitations due to wind erosion potential, low fertility and waterholding capacity. Low rainfall is the over-riding limitation.
U-D	0.6	Low isolated dunes of deep Molineaux Sand. Main soils: deep non calcareous sand - **H2b** (E) and deep calcareous sand - **H2a** (E). The sand dunes have deep infertile soils in a low rainfall area, making them highly susceptible to wind erosion.

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, Lithocalcic / Hypercalcic Calcarosol)
Calcareous sandy loam to clay loam over Class III B, III C or III A carbonate rubble grading to weathering rock within 50 cm.

A4 Calcareous sandy loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to sandy clay loam grading to rubbly carbonate at shallow depth and overlying highly calcareous clay loam to clay within a metre.

A5 Rubbly calcareous loam on clay (Regolithic, Lithocalcic / Hypercalcic Calcarosol)
Calcareous loam to clay loam grading to rubbly or soft carbonate at shallow depth, over clayey sediments within 100 cm.

A6 Deep calcareous loam on clay (Regolithic / Pedal, Hypercalcic Calcarosol)
Calcareous loam to clay loam grading to a highly calcareous clay over clayey sediments within 100 cm.

B2 Calcareous sandy loam on calcrete (Petrocalcic, Supracalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to sandy clay loam grading to rubbly carbonate at shallow depth overlying calcrete within 50 cm.

C2/D1 Loam over red clay (Calcic / Supracalcic, Red Dermosol / Chromosol)
Medium thickness hard setting sandy loam to loam over a well structured red clay with soft or rubbly carbonate at depth, overlying weathering quartzite or sandstone within 100 cm.

C3 Gradational loam (Lithocalcic / Calcic, Red Dermosol)
Medium thickness loam to clay loam grading to a well structured red clay, shallow over rubbly or soft carbonate.

D2 Loam over red clay (Hypercalcic / Lithocalcic, Red Chromosol)
Medium thickness hard setting loam to clay loam abruptly overlying a well structured red clay grading to soft (occasionally rubbly) carbonate.

H2a Deep calcareous sand (Calcic Calcarosol)
Very thick calcareous red sand grading to a highly calcareous clayey sand.

H2b Deep non calcareous sand (Calcareous, Arenic, Red-Orthic Tenosol)
Very thick loose red sand overlying a yellowish calcareous clayey sand.

M1 Deep gravelly sandy loam (Regolithic, Red-Orthic Tenosol)
Very thick gravelly sandy loam, usually paler coloured with depth.

Further information: DEWNR Soil and Land Program