BFT Beaufort Land System

Undulating rises with sand hills between Beaufort and Whitwarta

Area: 42.2 km^2

Annual rainfall 340 – 370 mm average

Geology: The Land System is formed on characteristic red clays of uncertain origin. They are morphologically similar to Hindmarsh Clay, but in places appear to be forming in weathering quartzitic basement rock. Limited analyses of the clay indicate that it is associated with high soil boron levels. They are almost entirely overlain by a veneer of highly calcareous sediments of the Woorinen Formation. These were deposited by the wind, but most of the layer has subsequently hardened to rubbly forms. Overlying the Woorinen materials along the southern side of the system are extensive spreads of Molineaux Sands which have been reworked into linear dunes.

Topography: The Beaufort Land System is an elevated land form standing up to 35 m above the River Wakefield flood plain which borders its southern side. Slopes are mostly 2-3% except for a small section of steeper land in the east where a bend in the Wakefield has cut into the slopes. Most of the southern slopes of the system are covered by a field of linear sand dunes with a south east - north west orientation. A well defined drainage depression cuts through the land in a north south direction near the eastern side. Apart from this there is no surface drainage pattern.

Elevation: 65 - 20 m

Relief: Maximum relief is 35 m

Soils: Calcareous loams, deep sands and loam over clay soils are the characteristic soils.

Main soils
A5 Rubbly calcareous loam over clay - extensive (slopes)
A4 Rubbly calcareous loam - limited (slopes)
A6 Calcareous loam - limited (lower slopes)
H2 Deep sand - limited (sand dunes)

Minor soils
D2/C3 Loam over red clay - lower slopes

Main features: The Beaufort Land System is a broad undulating rise consisting of two distinctive sections. The southern part is a gently inclined dune field characterized by a complex of low fertility sandy soils prone to wind erosion and shallow rubbly calcareous soils. The northern part is gently undulating with mainly shallow rubbly calcareous soils with restricted water holding capacity and possibly lime induced fertility problems. Root zone depths are restricted by high boron levels in the substrate clay.

Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Beaufort Land System:

SLU	% of area	Main features #
HME	4.8	Lower slopes and drainage depressions with slopes of 1-2% formed on medium to fine textured sediments. Main soils are loam over red clay - **D2/C3** (V), with calcareous loam - **A6** (C). These soils are deep, moderately fertile and well structured, although hard setting surfaces are likely on the loam over red clay soils. There is some potential for water erosion because of the possibility of run off from the surrounding higher ground.
IUB IUC	60.0 2.5	Undulating rises formed on red clayey sediments with variable (up to 20%) surface calcrete stone. **IUB** Rises to 30 m high with slopes of 2-3%. **IUC** Short slopes of 3-12%. Main soils: rubbly calcareous loam over clay - **A5** (V) and rubbly calcareous loam - **A4** (C) with calcareous loam - **A6** (L). These soils are all calcareous throughout with implications for nutrition management. Most are rubbly thereby restricting water availability to plants. The underlying clay is high in boron, so the potential rootzone is largely confined to the topsoil and rubbly layers. There are no physical limitations to root growth.
UEJ UEd	1.7 31.0	Dunefields with parallel sand hills overlying the IUB land surface. **UEJ** 30-60% low dunes with flat swales. **UEd** 30-60% low to moderate dunes with swale slopes of 2-3%. Main soils: Dunes: deep sand - **H2** (D) Swales: rubbly calcareous loam over clay - **A5** (V) with calcareous loam - **A6** (L). This is difficult land to manage due to the alternating deep infertile sandy soils of the dunes and the loamier calcareous soils of the swales. Soil fertility is a problem throughout, particularly on the sands. Wind erosion control is also important - there has been extensive soil movement in the past. The swales are similar to **IUB**.

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:

A4 Rubbly calcareous loam (Regolithic, Lithocalcic / Supracalcic Calcarosol)
15 - 30 cm calcareous sandy loam to sandy clay loam grading to rubbly Class III B or III C carbonate, becoming less rubbly with depth and continuing below 100 cm.

A5 Rubbly calcareous loam over clay (Regolithic, Lithocalcic / Supracalcic Calcarosol)
15 - 20 cm calcareous sandy loam to loam grading to rubbly Class III B or III C carbonate at 30 cm, becoming less rubbly with depth over red substrate clay at 85 cm.

A6 Calcareous loam (Pedal / Regolithic, Hypercalcic Calcarosol)
10 - 25 cm calcareous loam to clay loam becoming more clayey and calcareous with depth over soft to slightly rubbly clayey carbonate at 40 cm, grading to red substrate clay from 85 cm.

D2/C3 Loam over red clay (Calcic, Red Chromosol / Dermosol)
10 - 20 cm loam over a well structured red clay, with soft carbonate from 40 cm, grading to red substrate clay at 80 cm.

H2 Deep sand (Calcareous, Arenic, Red-Orthic Tenosol / Hypocalcic Calcarosol)
35 - 70 cm loose sand to loamy sand (non calcareous in 75%, calcareous in 25% of soils), usually with a slight clay accumulation at depth, over either rubbly carbonate at 75 cm or calcareous clayey sand continuing below 100 cm.

Further information: DEWNR Soil and Land Program