

# LYN Lyndoch Land System

Flats and low rises of the Lyndoch Valley between Williamstown and the North Para River

**Area:** 21.1 km<sup>2</sup>

**Annual rainfall:** 505 – 640 mm average

**Geology:** The land is formed on siltstones, slates and fine sandstones. Between the basement rock highs are extensive deposits of alluvium derived mainly from the rocks, but also from Tertiary deposits of adjacent land systems. These sediments are generally clayey, but silts and sands are common. There are minor residual Tertiary sand deposits on some basement highs. The rocks and unconsolidated sediments are generally mantled by a veneer of soft to semi hard carbonate of aeolian origin. This occurs as a layer between the soil and the underlying materials.

**Topography:** The Land System includes most of the upper Lyndoch Creek valley, although small areas drain into the adjacent Williamstown Land System to the south west. The landscape is a broad very gently inclined to flat valley drained by the north flowing Lyndoch Creek. The flats are flanked by low basement rock rises. Isolated hillocks of remnant Tertiary sediments are superimposed on the rises.

**Elevation:** 310 m in the south to 150 m in the north where Lyndoch Creek flows out

**Relief:** Up to 30 m

**Soils:** Most soils are deep over alluvium or deeply weathered rock. Red loamy texture contrast profiles account for half the soils of the System. Brown loamy and sandy texture contrast soils and deep dark clay loams are typical associated soils. On basement rock highs, shallow red loamy soils are predominant.

## Main soils

**D1** Shallow loam over red clay on calcified basement rock

**D2** Loam over red clay on alluvium

## Minor soils

### *Soils formed on calcified basement rock*

**C2** Shallow gradational red loam on rock

**L1** Shallow stony loam

### *Soils formed on deeply weathered rocks*

**A6** Gradational calcareous clay loam

**C3** Gradational friable red clay loam

**E1** Black cracking clay

### *Soils formed on alluvium*

**C1** Gradational red sandy loam

**D3** Sandy loam over poorly structured red clay

**F2** Sandy loam over poorly structured black (**F2a**) or brown (**F2b**) clay

**G3** Thick sand over clay

**G4** Sand over poorly structured brown clay

**M1** Deep sandy loam

**M2** Deep dark clay loam



**Main features:** The Lyndoch Land System comprises undulating rises and flats. Soils on rises are moderately deep to shallow red loams over basement rock. These are fertile and well drained, with high horticultural potential. They are associated in places with deep clay loamy soils and cracking clays, with very high potential for all types of agriculture. The flats have deep, mostly texture contrast soils, usually with hard setting surfaces and dispersive clay subsoils. Drainage, workability, emergence and root growth are impeded. Black clay loamy soils are typical of the flats in the Lyndoch area. Although highly fertile, these soils have shallow water tables and are susceptible to salinity. Overall the flats are potentially productive, but drainage and irrigation management requirements are high.

**Soil Landscape Unit summary:** 11 Soil Landscape Units (SLUs) mapped in the Lyndoch Land System:

SLU	% of area	Main features #
AzC	0.7	<p>Series of N-S to NW-SE trending ridges with parallel crests approximately 500 metres apart, formed on schists, phyllites and interbedded quartzites. Slopes range from 10% to 50% (usually 20% to 40%). Relief is 50 to 100 metres. Most soils have loamy surfaces and clayey subsoils. Shallow stony soils occur near rocky outcrops.</p> <p>Main soils: <u>Sandy loam over red clay</u> - <b>K3</b> (E)  <u>Shallow stony sandy loam</u> - <b>L1</b> (C) } in rocky areas  <u>Acidic gradational loam</u> - <b>K1</b> (L) }  <u>Acidic sandy loam over brown clay</u> - <b>K4</b> (L)  <u>Sandy loam over brown sandy clay</u> - <b>F1/F2</b> (M) } on lower slopes  <u>Deep sandy loam</u> - <b>M1</b> (M) }</p> <p>The land is too steep for cultivated cropping but has some potential for perennial crops. The soils are variable, but the K3 and K1 soils are reasonably fertile, well drained and moderately deep. The shallow stony soils are limited by poor waterholding capacity, while the K4 soils are infertile and imperfectly drained. All soils are highly erodible.</p>
DBC	33.6	<p>Undulating rises formed on siltstones, slates and fine sandstones, mantled by soft fine grained carbonate. Slopes range from 2-10%, with relief to 30 m. There is negligible rock outcrop, but minor surface slate, sandstone, quartz and calcrete occurs. Watercourses are moderately well defined, and sometimes gullied, in shallow, broad drainage depressions. The predominant soils have loamy or less commonly sandy surfaces overlying red brown clay subsoils.</p> <p>Main soils: <u>Shallow loam over red clay on rock</u> - <b>D1</b> (E) on slopes  <u>Loam over red clay</u> - <b>D2</b> (L) on lower slopes and drainage depressions</p> <p>These soils are moderately deep to deep, inherently fertile and adequately drained. Apart from poor surface structure and associated erosion potential, there are no significant limitations, and productive potential for both field and horticultural crops is high.</p>
DCC	1.7	<p>Undulating rises up to 20 m high formed on calcified siltstones, slates and fine sandstones. Slopes range from 4% to 12%. Rock outcrop is sporadic, up to 10% on isolated crests. Most soils are shallow over calc-siltstone.</p> <p>Main soils: <u>Shallow loam over red clay on rock</u> - <b>D1</b> (E)  <u>Shallow gradational red loam</u> - <b>C2</b> (E)  <u>Shallow stony loam</u> - <b>L1</b> (L)</p> <p>The soils are fertile and well drained, but often shallow with restricted water holding capacity. Surface soils set hard, creating workability and emergence problems, and increasing erosion susceptibility. However, the land is potentially productive, and is particularly suited to horticultural development where water is available.</p>
DFC	15.6	<p>Undulating rises to 20 m high formed on calc- siltstones and slates. Slopes are 3-10%. Marked soil variability is attributable to the range of parent materials.</p> <p>Main soils: <u>Shallow loam over red clay</u> - <b>D1</b> (C) } on basement rocks  <u>Shallow gradational red loam</u> - <b>C2</b> (C) }  <u>Shallow stony loam</u> - <b>L1</b> (L) }  <u>Gradational calcareous clay loam</u> - <b>A6</b> (L) } on deeply weathered rocks  <u>Gradational friable red clay loam</u> - <b>C3</b> (L) }</p>



		<p><u>Black cracking clay</u> - <b>E1</b> (L) }</p> <p><u>Loam over red clay</u> - <b>D2</b> (M) on lower slopes</p> <p>The shallower soils on basement rock are similar to those of DCC, but the deeper soils on highly weathered rocks or alluvium are fertile and have high water holding capacities. Although some have poor surface structure, they are potentially highly productive.</p>
GBD	3.0	<p>Gently rolling rises and low hills to 50 m high, formed on Tertiary clayey sands, sandy clays and gravels, usually weakly indurated to sandstones and conglomerates. Slopes are 8-16%. Drainage depressions are broad and shallow with weakly defined watercourses. Sand to sandy loam over clay soils are dominant, with deep sandy loams and gravels.</p> <p>Main soils: <u>Bleached sand over sandy clay loam</u> - <b>G2/G5</b> (E)</p> <p><u>Ironstone gravelly sandy loam over red clay</u> - <b>D6</b> (C)</p> <p><u>Sandy loam over poorly structured brown clay</u> - <b>F2a</b> (L)</p> <p><u>Shallow stony loamy sand</u> - <b>M3</b> (L)</p> <p><u>Deep loamy sand</u> - <b>M1a</b> (M)</p> <p>Although the soils are variable, low natural fertility is an over-riding feature. Most soils are moderately deep to deep, and most are acidic. Impeded drainage is a limitation on F2a soils, but drainage is adequate in the others. Most of the soils are highly erodible to both wind and water, so care is needed during crop establishment. The land is generally suited to perennial horticulture and viticulture, where water is available.</p>
JBB JBE	4.1 4.8	<p>Very gently sloping outwash fans and drainage depressions formed on alluvial clays mantled by fine grained carbonates of aeolian origin.</p> <p><b>JBB</b> Very gently inclined fans with slopes of 2-4%.</p> <p><b>JBE</b> Drainage depressions with well defined and sometimes eroded watercourses.</p> <p>Most soils have red texture contrast profiles with loamy sand to clay loam surfaces, and clayey subsoils. There are limited areas of heavy black soils.</p> <p>Main soils: <u>Loam over red clay</u> - <b>D2</b> (E)</p> <p><u>Sandy loam over poorly structured red clay</u> - <b>D3</b> (C)</p> <p><u>Gradational red sandy loam</u> - <b>C1</b> (L)</p> <p><u>Deep dark clay loam</u> - <b>M2</b> (L)</p> <p>These soils are deep and inherently fertile. Poor structure, especially in D3 soils, and associated drainage, infiltration, workability and emergence problems are the main limitations. Improved surface management and gypsum applications will help to alleviate the problem. Productive potential is high.</p>
JUB JUI	15.0 4.0	<p>Alluvial flats and outwash fans formed on alluvial silts, clays and sands usually mantled by fine grained soft carbonates. Except for short, steep stream banks, slopes are less than 4%.</p> <p><b>JUB</b> Alluvial flats and adjacent fans in the Tweedie Gully area with slopes of 2-4%. The main watercourse is eroded in places.</p> <p><b>JUI</b> Alluvial flats and terraces of upper Lyndoch Creek, the channel of which is deeply eroded.</p> <p>Because of the variability of parent sediments, there is a range of soils. The more extensive types have sandy to loamy surfaces overlying reddish or dark coloured sandy clay to clay subsoils, all with soft carbonate accumulations at depth. Near watercourses there are deep medium to coarse grained alluvial soils.</p> <p>Main soils: <u>Loam over red clay</u> - <b>D2</b> (E)</p> <p><u>Gradational red sandy loam</u> - <b>C1</b> (C)</p> <p><u>Sandy loam over poorly structured black clay</u> - <b>F2a</b> (L)</p> <p><u>Deep sandy loam</u> - <b>M1</b> (L)</p> <p>The soils are deep and moderately fertile but with variable structure and drainage conditions. They tend to be sandier and more erodible than the related soils in JBB/JBE. They are highly susceptible to hard setting, so conservative soil management is needed to maintain surface structure. There is minor saline seepage. With appropriate management, productive potential is high.</p>
KUA	14.8	<p>Level plains formed on grey to black clays, mantled by soft fine grained carbonates. Slopes are less than 1%. A discontinuous natural watercourse exists but artificial channels have been constructed to facilitate drainage. The main soils are deep, black, medium to fine textured profiles with soft carbonate at depth. Other soils have lighter textured surfaces overlying dark coloured, red or mottled brown clays.</p> <p>Main soils: <u>Deep dark clay loam</u> - <b>M2</b> (E)</p>



		<p><u>Sandy loam over poorly structured black clay - F2a (C)</u>  <u>Sandy loam over poorly structured red clay - D3 (L)</u>  <u>Sandy loam over poorly structured brown clay - F2b (L)</u></p> <p>The soils are deep and fertile but generally imperfectly drained. This situation is exacerbated in places by shallow water tables. Salinity is an associated threat. With adequate drainage the land is potentially highly productive.</p>
LGJ	2.7	<p>Alluvial flats and drainage depressions formed on alluvial sands, clayey sands and sandy clays derived from Tertiary sediments and underlying basement rocks. Watercourses are well defined and often deeply eroded. Most soils have texture contrast profiles with sandy to loamy surfaces and clayey subsoils which are generally sodic although variable in colour and structure. There are also deep alluvial sandy loams.</p> <p>Main soils: <u>Sand over poorly structured brown clay - G4 (E)</u>  <u>Thick sand over clay - G3 (C)</u>  <u>Sandy loam over poorly structured red clay - D3 (L)</u>  <u>Sandy loam over poorly structured black clay - F2a (L)</u>  <u>Deep sandy loam - M1 (L)</u></p> <p>These soils are deep but commonly imperfectly drained. Natural fertility is low to moderate, and most are neutral at the surface to alkaline with depth. Watercourse erosion is a problem in places and there is sporadic saline seepage. The land is generally unsuited to cropping, but there is potential for horticultural/viticultural development provided adequate drainage can be maintained.</p>

# 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:

#### **A6** Gradational calcareous clay loam (Pedal, Calcic Calcarosol)

Medium thickness reddish brown calcareous loam to clay loam, grading to a well structured reddish brown clay subsoil, becoming more clayey and calcareous with depth. Coarsely structured, brown heavy clay continues below 200 cm.

#### **C1** Gradational red sandy loam (Calcic, Red Kandosol)

Thick reddish brown loamy sand to fine sandy loam with a pink A2 horizon, overlying a yellowish red weakly structured clay loam to clay, calcareous with depth.

#### **C2** Shallow gradational red loam on rock (Hypercalcic, Red Dermosol)

Medium thickness red brown loam to clay loam, grading a red, well structured clay loam, grading to massive semi hard carbonate, over weathering siltstone below 50 cm.

#### **C3** Gradational friable red clay loam (Calcic, Red Dermosol)

Medium thickness dark reddish brown clay loam, overlying a dark reddish brown, well structured clay subsoil which is calcareous with depth. Highly calcareous clay continues below 100 cm.

#### **D1** Shallow loam over red clay on rock (Hypercalcic, Red Chromosol)

Medium thickness hard setting loam with a paler and stony A2 horizon, overlying a dark reddish brown, well structured clay which is highly calcareous from about 50 cm. Weathering, calcified siltstone or slate occurs within 100 cm.

#### **D2** Loam over red clay (Sodic, Calcic, Red Chromosol)

Thick hard loam with a paler coloured A2 horizon, overlying a dark reddish brown, well structured clay, highly calcareous (Class I carbonate) from about 60 cm. The soil grades to medium to fine grained alluvium below 100 cm.



- D3** Sandy loam over poorly structured red clay (Calcic, Red Sodosol)  
Thick reddish brown hard massive loamy sand to loam with a pink, very hard A2 horizon, overlying a reddish brown clay with prismatic structure and many soft carbonate segregations (Class I carbonate) from 65 cm.
- E1** Black cracking clay (Self-Mulching, Black Vertosol)  
Medium thickness brown to black well structured light clay, grading to dark brown to black strongly structured heavy clay, calcareous with depth. Coarsely structured, brown heavy clay with soft calcareous segregations continues below 200 cm.
- F2a** Sandy loam over poorly structured black clay (Calcic, Black Sodosol)  
Thick grey hard massive loamy sand to silty loam, often with a bleached A2 horizon, overlying a black or dark grey prismatic structured clay, sometimes with yellowish brown mottles and soft calcareous segregations with depth, grading to alluvium.
- F2b** Sandy loam over poorly structured brown clay (Calcic, Brown Sodosol)  
Thick grey brown massive sandy loam to loam with a bleached A2 horizon, overlying a yellowish brown, dark brown and grey mottled clay with strong blocky structure and soft Class I carbonate segregations from 75 cm.
- G3** Thick sand over clay (Eutrophic, Brown / Red Sodosol)  
Thick grey sand with a bleached A2 horizon, overlying a yellow brown, dark brown, red and grey mottled sandy clay to clay with coarse prismatic structure, grading to a sandier sediment below 100 cm.
- G4** Sand over poorly structured brown clay (Calcic, Brown Sodosol)  
Thick brown loamy sand to light sandy loam with a bleached A2 horizon, overlying a yellow brown, grey brown and red mottled clay with columnar structure, grading to a Class I carbonate layer of soft calcareous segregations at 70 cm.
- L1** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)  
Thick, stony, reddish brown loam, grading to highly calcified weathering siltstone or fine sandstone before 50 cm.
- M1** Deep sandy loam (Regolithic, Red-Orthic Tenosol)  
Thick brown sandy loam to loamy sand, overlying a reddish brown clayey coarse sand to silty sand, grading to variable sandy and gritty alluvial sediments.
- M2** Deep dark clay loam (Calcic, Black Dermosol)  
Medium thickness black clay loam to light clay with moderate blocky structure, overlying a black clay with strong blocky structure and abundant soft Class I carbonate segregations from 30 cm.

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

