OTH One Tree Hill Land System

Sandy ridges in the One Tree Hill area

Area: 10.7 km^2

Annual rainfall: 620 – 665 mm average

Geology: The land is underlain by interbedded basement sandstones and siltstones with minor quartzites. However, over more than 50% of the area the rocks are covered by a veneer of Tertiary sediments. These are mainly clayey sands to sandy clays which have become indurated to varying degrees to form weak sandstones. These materials are reworked in places, giving rise to unconsolidated sandy or sandy clay deposits. Minor medium to fine grained alluvial sediments occur on creek flats.

Topography: The predominant feature of the landscape is a north - south ridge with a rounded crest, grading to steeper side slopes on the western and southeastern margins. The side slopes are commonly rocky (where basement rocks have been exposed). Drainage is mostly to the west, but there is a significant watercourse flowing south.

Elevation: 210 - 296 m

Relief: Up to 50 m

Soils: The predominant soils are sandy surfaced texture contrast types with sandy clay subsoils, formed over Tertiary sandstones, or reworked sandy sediments. Sandy loam and loam texture contrast soils over basement rocks are common, associated with shallow stony soils formed directly on basement rock. Deep sandy loam over clay soils over alluvium occur on minor creek flats.

Main soils

Soils formed on Tertiary sediments

G2 Bleached sand over sandy clay loam
F2 Sandy loam over poorly structured brown clay
G3 Thick sand over clay

Soils formed in weathering basement rock

D1 Shallow sandy loam to loam over red clay
K4 Acidic sandy loam over brown clay
L1a Shallow stony sandy loam
L1b Shallow stony loam

Minor soils

Soils formed on alluvium

M1 Deep loamy sand
F1 Sandy loam over brown mottled clay

Main features: The One Tree Hill Land System is characterized by a rounded ridge with mainly sandy soils. These are moderately deep, but infertile and subject to wind erosion, acidification and water repellence. They are not productive cropping soils, but where water is available, they are suitable for horticulture and viticulture, although imperfectly drained patches should be avoided. Floriculture has some potential. The steeper sideslopes underlain by basement rocks have more fertile loam over clay soils mixed with shallow stony soils. These areas are mostly semi to non-arable, but have some horticultural potential, although rocky pockets are only suitable for grazing.

Soil Landscape Unit summary: 7 Soil Landscape Units (SLUs) mapped in the One Tree Hill Land System:

SLU	% of area	Main features #
AsC	10.4	Short rocky slopes to 30 m high formed on sandstones with limited interbedded quartzites. Slopes are 18-30%, with up to 10% rocky outcrop and 10-20% surface stone. Most soils have gritty sandy loam surfaces and are moderately deep to shallow over bedrock. Clayey subsoils usually occur, but soil depth is highly variable. Main soils: Acidic sandy loam over brown clay on rock - **K4** (V) Shallow stony sandy loam - **L1a** (E) The soils are moderately well to well drained, but most have low natural fertility and are prone to acidification. Moderately steep and often rocky slopes are the main limitation to land use. They are suitable for perennial crops (where water is available) and improved pastures, but are not arable. Most soils are highly erodible - maintenance of protective surface cover is essential.
CaD	14.8	Moderate slopes to 30 m high formed on sandstones with limited interbedded quartzites. Slopes are 10-18%. There is up to 10% surface sandstone and quartzite, but virtually no outcrop. Most soils have gritty sandy loam surfaces and are moderately deep to shallow over bedrock. Clayey subsoils are usually present, but soil depth is highly variable. Main soils: Acidic sandy loam over brown clay on rock - **K4** (V) Shallow stony sandy loam - **L1a** (C) The soils are moderately well to well drained, but most have low natural fertility and are prone to acidification. They are suitable for perennial crops (where water is available) and improved pastures, and are only semi arable. Most soils are highly erodible - maintenance of protective surface cover is essential.
DGD	14.1	Gently rolling slopes of 8-20% with relief to 40 m, formed on weakly calcified siltstones, slates and fine sandstones. Soils are loamy, usually with a clayey subsoil and variable carbonate content. Main soils: Shallow sandy loam to loam over red clay on rock - **D1** (V) Shallow stony loam - **L1b** (L) on steeper slopes These soils are mostly moderately deep, naturally fertile and well drained. Poor surface structure is the main limitation. As well as affecting tillage and plant establishment, this also increases susceptibility to erosion. The gentler slopes are suitable for cropping, and all land is suitable for perennial horticulture and viticulture where water is available.
GBD	49.7	Undulating upper slopes of 2-10% formed on Tertiary sandstones, with reworked sandy sediments in hollows and depositional areas. There is negligible surface stone and there are no defined watercourses. Soils are invariably sandy surfaced, usually with more clayey subsoils, but some deep gritty sands occur on reworked sediments. Main soils: Bleached sand over sandy clay loam - **G2** (E) Sandy loam over poorly structured brown clay - **F2** (C) Thick sand over clay - **G3** (L) Deep loamy sand - **M1** (L) These soils are moderately deep, but highly infertile and prone to acidification and water repellence. Drainage is variable, usually moderately well to well, but some hollows are imperfectly drained with seepage areas. The sands are highly erodible, to both wind and water, so cropping is not generally sustainable. Most of the land is suitable for perennial horticulture and viticulture, although drainage management is required in some parts.

GFC	3.7	Lower slopes of 4-8% formed on reworked Tertiary sediments - gritty sands to sandy clays. Main soils: Thick sand over clay - **G3** (E) Deep loamy sand - **M1** (E) These soils are moderately deep, but highly infertile and prone to acidification. The sand over clay soils are imperfectly drained. Productive potential is moderately low but where drainage is not a problem, there is some horticultural potential.
KIE	2.0	Drainage depressions, including concave lower slopes and creek flats, formed on alluvium associated with hillslopes of calcified siltstones and slates. Slopes range from 2% on flats to 10% on lower slopes adjacent to surrounding rising ground. Deep sandy or loamy soils with clayey subsoils, together with a range of miscellaneous alluvial soils occur on the floors of the depressions. On lower slopes, shallower soils are more common, formed on siltstone, or siltstone capped by soft to semi-hard carbonate. Main soils: Gradational red sandy loam - **C1** (C) } on flats Deep sandy loam - **M1** (C) } Shallow calcareous loam - **A2** (L) } on rock on lower slopes Shallow gradational red loam - **C2** (L) } Shallow loam over red clay - **D1a** (L) } The soils of the flats are deep, well drained and moderately fertile, but small in area, so development potential is limited. The soils of the lower slopes are moderately shallow (restricted water holding capacity), but well drained and fertile.
LDE	5.3	Creek flats underlain by medium to fine grained alluvium. Main soil: Sandy loam over brown mottled clay - **F1** (D) These are deep and moderately fertile but subject to waterlogging due to perching of water on the clayey subsoil. Generally the land is not suitable for horticulture or cropping, but is potentially productive for grazing.

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 Shallow sandy loam to loam over red clay on rock (Hypercalcic, Red Chromosol)
Medium thickness hard setting sandy loam to 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.

F1 Sandy loam over brown mottled clay (Bleached-Mottled, Hypocalcic, Brown Chromosol)
Thick loamy sand to light sandy clay loam, with a bleached and gravelly A2 horizon, overlying a yellowish brown, brown and red mottled firm coarsely structured clay, weakly calcareous with depth.

F2 Sandy loam over poorly structured brown clay (Eutrophic, Brown Sodosol)
Thick brown loamy sand to sandy loam with a bleached and quartz gravelly A2 horizon, overlying a brown, yellow and red mottled clay with strong blocky structure, grading to soft sandstone deeper than 100 cm.

G2 Bleached sand over sandy clay loam (Bleached, Mesotrophic, Brown Chromosol)
Thick grey sand with a bleached A2 horizon containing ironstone and sandstone gravel, overlying a brown, yellow and red sandy clay loam to clay, grading to weakly cemented Tertiary sandstone within 100 cm.

G3 Thick sand over clay (Eutrophic, Brown Sodosol)
Thick grey sand with a bleached A2 horizon, overlying a yellow brown, dark brown and grey mottled sandy clay to clay with coarse prismatic structure, grading to sandier sediment below 100 cm.

K4 Acidic sandy loam over brown clay on rock (Bleached, Mesotrophic, Brown Kurosol)
Medium to thick, gravelly to gritty loamy sand to sandy loam, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay grading to weathering medium to fine sandstone by 100 cm.

L1a Shallow stony sandy loam (Acidic, Paralithic, Bleached-Leptic Tenosol)
Thick, greyish, very gravelly loamy sand to sandy loam with a bleached A2 horizon, grading to hard metasandstone by 50 cm.

L1b Shallow stony loam (Calcareous, Paralithic, Red-Orthic Tenosol)
Thick, stony, reddish brown loam, grading to highly calcified weathering siltstone or fine sandstone before 50 cm.

M1 Deep loamy sand (Basic, Regolithic, Red-Orthic Tenosol)
Very thick brown loamy sand with a yellowish and quartz gravelly A2 horizon, overlying a yellowish red clayey sand with variable gravel.

Further information: DEWNR Soil and Land Program