

## 5.2 Soils

Soil development is dependent upon a number of interrelating factors that include parent material, topography, vegetation, climate and time. The many soil types in the Shire of Romsey reflect the variations in these factors. This report identifies the specific location of each of these soils and describes their properties in detail.

In this chapter the soils are discussed in general terms and have been grouped into the geomorphic units already described in the preceding chapter. More detailed descriptions of the soils and their corresponding map units are provided in Section 4.

The soil types have been described and categorised, into three major groups, according to Northcote (1979).

Uniform soils: Soil profiles with very little, if any, texture change with depth

Gradational soils: Soil profiles that become increasingly finer textured (greater clay content) with depth.

Duplex soils: Soil profiles that have a clearly pronounced texture contrast between the A and B horizons.

### 5.2.1 Sedimentary Gently Undulating Rises/Undulating Rises/Rolling Low Hills/Steep Hills

Only two of the major soil groups occur on these landforms. The majority of the soil is yellow duplex that occurs in three different forms. Uniform silty clays occur in the drainage depressions and uniform clay loams occur on the steep hills.

#### Yellow duplex soils

Factual Key: Dy3.11

Map Units: Ssc, Ssf, Ssg, Ssa

Plate 1

These yellow duplex soils have a hardsetting loam topsoil and a mottled medium clay subsoil. They occur on the moderately steep slopes and crests as well as the gentler slopes. They are generally strongly acidic and toxic in aluminium throughout the profile. Nutrient status tends to be low to very low.

Factual Key: Dy3.21

Map Unit: Ssa

Plate 2

The sedimentary crests occur with or without an A2 horizon. These duplex soils with a hardsetting loam topsoil and a mottled clayey subsoil, have an A2 horizon that is not bleached. This soil is strongly acidic and toxic in

aluminium as well as having a low to very low nutrient status.

Factual Key: Dy3.41

Map Unit: Ssd

Plate 3

On the moderate slopes, duplex soils with a hardsetting loam topsoil, a gravely bleached A2 horizon, and a mottled clayey subsoil occur. The soil is strongly acidic and toxic in aluminium and has a low to very low nutrient status.

#### Uniform silty clays

Factual Key: Uf4.3

Map Unit: Ssh

Plate 4

On the steeper sloping drainage depressions uniform structured silty clays with an unbleached A2 horizon, and a subsoil with porous peds occur. The subsoil is moderately to highly dispersible therefore the incidence of gully erosion is high. The incidence of salting is also high.

#### Uniform clay loam

Factual Key: Um6.14

Map Unit: Ssb

Plate 5

Shallow clay loams are located mainly on the steep downcutting slopes to the drainage lines. The soils have clearly evident porous peds, with a whole coloured brown subsoil. The profile has many sedimentary and quartz gravel fragments throughout. The soils typically have a low nutrient status and are deficient in phosphorus and potassium.

### 5.2.2 Granodiorite Rolling Hills/Steep Hills

Red and brown duplex soils and reddish brown gradational soils occur on these landforms.

#### Red duplex soils

Factual Key: Dr3.22

Map Unit: Dg1b

Plate 6

The red duplex soils found on the granodiorite steep slopes have hardsetting sandy clay loam topsoils, an A2 horizon that is not bleached and a mottled clayey subsoil. The soils generally have a low nutrient status and have a low dispersibility.

Factual Key: Dr3.42

Map Unit: Dg1a

Plate 7

Red duplex soils occur on the steep and gentle crests and ridges. The soils have a hardsetting sandy loam topsoil, conspicuously bleached A2 horizon, and a mottled sandy clay subsoil. Depth to hardrock is variable and can be as

shallow as 0.8 m. They have a low dispersibility throughout the profile and have a low nutrient status.

Factual Key: Dr3.12

Map Unit: Dg1d

Although the red granitic moderate slopes are very variable, red duplex soils with a mottled subsoil occur. The topsoil is commonly a sandy clay loam, with a clear transition to a clayey subsoil.

#### Red brown duplex soils

Factual Key: Db2.11/Dr2.11

Map Units: Dg1h, Dg1c

Plate 8

The brown or red duplex soils occur on the granitic drainage depressions. The brown variety is due to the top of the B horizon having a high organic matter content. When this is reduced the soils are red duplex. The soils on the moderately steep slopes are also red duplex when they lack a transitional horizon. The moderately steep slopes have a coarse sandy loam topsoil and a whole coloured medium clay subsoil. The soils on the drainage depressions have a low nutrient status and low dispersibility.

#### Reddish brown gradational soils

Factual Key: Gn4.11

Map Unit: Dg1c

The moderately steep slopes commonly have coherent whole coloured reddish brown subsoils characterised by porous peds. The texture generally ranges from a coarse sandy loam, sandy clay loam topsoil to a sandy clay grading to a medium clay subsoil. This landform is highly susceptible to sheet and rill erosion and to a lesser extent gully erosion.

### **5.2.3 Granite Rolling Low Hills/Undulating Rises/Steep Hills/Plateaux**

The three major soil groups are found in these landforms, yellow duplex, yellowish brown gradational soils and uniform coarse sands.

#### Yellow duplex soils

Factual Key: Dy3.11

Map Unit: Dg2c

Plate 9

These yellow duplex soils have a hardsetting sandy loam topsoil with an abrupt transition to a mottled clayey subsoil. They occur on the yellow granitic moderately steep slopes. They are generally strongly acidic, toxic in aluminium, deficient in phosphorous and potassium and have a very low nutrient status throughout the profile. Depth of soil is variable. It is often deeper on the yellow granodiorite soils compared to the granite. Plate 9 shows the deeper granodiorite soils.

Factual Key: Dy3.41

Map Unit: Dg2f

The soils on the granitic gentle slopes are yellow duplex with a mottled subsoil. There is a clear transition from the hardsetting clay loam topsoil to the bleached A2 horizon that overlies the clayey subsoil.

Factual Key: Dy2.11

Map Unit: Dg2h

Hardsetting clay loam topsoils overlying a clayey whole coloured subsoils are found on the granite drainage depressions.

#### Yellowish Brown gradational soils

Factual Key: Gn4.52/1

Map Unit: Dg2x, Dg2d

Plate 10

These soils have a sandy clay loam topsoil with a gradual transition to a sandy clay grading to a medium heavy clay subsoil on the plateaux and a clear transition to a heavy clay loam grading to a sandy clay on the moderate slopes. The soils tend to be deficient in phosphorous, toxic in aluminium and have a low to very low nutrient status through the profile. The topsoil and the transitional B horizon are strongly acidic on the moderate slopes. The soils on the moderate slopes are variable in depth. Plate 10 shows the shallow variant.

#### Uniform coarse sand

Factual Key: Uc1.21

Map Unit: Dg2a, Dg2b

The soils on the granite crests and steep slopes are generally shallow. These soils have an apedal, light sandy clay loam topsoil and subsoil. Bedrock often occurs within 0.4 m although it is variable. Granitic tors occur particularly on the crests.

### **5.2.4 Rhyodacite Steep Hills/Rolling Low Hills**

Gradational profiles are the only soil category found on the rhyodacite.

#### Dark reddish brown gradational soils

Factual Key: Gn3.11

Map Units: Dra, Drb, Drc, Drd

Plate 11

Dark reddish brown gradational soils occur on every represented map unit in the rhyodacite, with the exception of the drainage depressions. The topsoils grade from a loam to a clay loam, overlying silty clay loam transitional horizons leading to the more clayey subsoil. The major B horizon is whole coloured, although mottling does occur in the transitional horizons. The subsoil has a low nutrient

status, although the topsoil is moderate to high. There are toxic levels of aluminium, although the soil does not tend to be strongly acidic.

#### Dark grey gradational soils

Factual Key: Gn4.51

Map Unit: Drh

As with most drainage depressions the soils are variable, although a common soil type tends to be a dark grey, whole coloured gradational soil. The topsoil is a sandy loam grading to a clay loam, with the subsoil being a light clay.

### **5.2.5 Basalt Lava Plain/Undulating Low Hills/Steep Low Hills**

The soils on these landforms are varied. There are yellow, dark and brown duplex soils, dark brown gradational soils, and uniform silty loams.

#### Yellow duplex soils

Factual Key: Dy2.3

Map Unit: Qbg Plate 12

The very gentle slopes of the basalt plain are yellow duplex with a hardsetting silt loam topsoil. The A2 horizon is sporadically bleached with a high percentage of gravel fragments. There is an abrupt transition to a whole coloured clayey subsoil. The soil tends to be strongly acidic and toxic in aluminium. The A horizon has a very low nutrient status although it is moderate to high in the subsoil.

#### Dark duplex soils

Factual Key: Db2.12

Map Unit: Qbh

Plate 13

Very dark greyish brown duplex soils occur on the basalt drainage depressions. The hardsetting loam topsoil overlies a clayey subsoil. The nutrient status of the subsoil is very high, although it is deficient in phosphorous and potassium throughout the profile.

#### Brown duplex soils

Factual Key: Db2.12

Map Unit: Qbe

Hardsetting clay loam topsoils over a mottled clayey subsoil occur on the basalt gentle crests.

Factual Key: Db1.12

Map Unit: Qbb Plate 14

The steep basalt hills commonly have brown duplex soils with a hardsetting clay loam topsoil with an abrupt transition to a whole coloured clay subsoil. Occasionally there is a discontinuous weakly cemented massive red-brown hardpan at the beginning of the subsoil. The subsoil

has many basaltic gravel fragments. Permeability is very rapid.

Factual Key: Db1.12

Map Unit: Qbf Plate 15

The soils on the basalt gentle slopes, have brown duplex soils, commonly on the lower slopes. The soils have a hardsetting clay loam topsoil with an abrupt transition to a whole coloured clayey subsoil. The nutrient status in the subsoil is high although it is deficient in potassium.

#### Dark brown gradational soils

Factual Key: Gn4.42

Map Units: Qbc, Qbd

Plate 16

Dark brown gradational soils occur on the basalt moderate and moderately steep slopes. The soils have a silty clay loam topsoil with a gradual transition to a silty clay subsoil. The map units are moderate to highly susceptible to sheet and rill erosion. Permeability is rapid.

#### Uniform silty loam

Factual Key: Um1.14

Map Unit: Qba

Plate 17

Shallow uniform silty loams occur on the basalt cones. The soil is only weakly structured and does not have a developed B horizon. The transitional horizons have abundant gravel fragments. Soil depth is variable although it can be as shallow as 0.5m. Permeability is rapid.

Factual Key: Um1.44

Map Unit: Qbr

Plate 18

This soil type occurs on areas of rock outcrop greater than 50%. The very dark greyish brown soils have a moderately structured shallow loam topsoil, consisting of high amounts of organic matter. The subsoil has little pedological structure. Soil depth is commonly no deeper than 0.5m. There are many fine basalt fragments throughout the profile.

### **5.2.6 Quaternary Volcanic Rolling Hills/Rolling Low Hills/Undulating Low Hills/Steep Hills**

The three major soil types occur on these landforms. Red, yellow and brown gradational soils, uniform clays, and yellow and dark duplex soils.

#### Yellowish red gradational soils

Factual Key: Gn3.51

Map Unit: Qvc

Plate 19

Yellowish red gradational soils occur on the moderately

steep slopes. They tend to have a deep silty loam topsoil, overlying a mottled heavy silt loam transitional layer which grades to a mottled heavy clay loam subsoil. The topsoil tends to be acidic and have toxic aluminium levels throughout the profile with the exception of the subsoil. The nutrient status improves in the subsoil.

Factual Key: Gn4.12  
Map Unit: Qvb

The yellowish red gradational soils found on the volcanic steep slopes have a clay loam, fine sandy loam topsoil, with a clear transition to a sandy clay subsoil. The topsoil tends to be acidic and the aluminium levels are possibly toxic.

Brown gradational soils  
Factual Key: Gn2.41  
Map Unit: Qva

The brown gradational soils found on the volcanic crests are generally quite shallow. The weakly structured profile grades from a silty loam topsoil to a silty clay loam subsoil. The topsoil tends to be acidic and the aluminium levels are possibly toxic.

Dark reddish brown gradational soils  
Factual Key: Gn3.12  
Map Unit: Qvf

The soils on the volcanic gentle slopes grade from a heavy silty loam topsoil to clay loam and heavy clay loam transitional horizons to a light clay subsoil. The soil tends to be strongly structured with smooth faced peds throughout.

Yellow duplex soils  
Factual Key: Dy2.11  
Map Unit: Qvd

The soils on the moderate slopes of the volcanic lithology tend to have clay loam with fine sand topsoils, with a clear transition to a moderately structured medium clay subsoil.

Dark duplex soils  
Factual Key: Dd1.12  
Map Unit: Qvh

The soils on the volcanic drainage depressions have a loam to silty clay loam topsoil, overlying a mostly whole coloured clay subsoil. The nutrient status in the subsoil is high to very high.

Uniform clays Factual Key: Uf6.12  
Map Unit: Qve, Qvg

The soils on the volcanic gentle crests and very gentle slopes are uniform strongly structured clays. The soils on the crests are generally shallow, although there are pockets of deeper soil.

## 5.2.7 Sedimentary and Conglomerate Steep Hills/Rolling Low Hills

The soils on the upper slopes of these landforms are commonly uniform coarse sands, and gradational soils tend to occur on the lower slopes.

Red brown gradational soils  
Factual Key: Gn4.51  
Map Units: Dsf, Dsd

The gradational soils on the gentle and moderate slopes have a coarse sandy loam topsoil with a gradual transition to a sandy clay subsoil. The soils are commonly of low fertility.

Uniform coarse sandy loams  
Factual Key: Uc6.11  
Map Units: Dsb, Dsa, Dsc

The uniform coarse sands found on the steep slopes, steep crests and moderately steep slopes are commonly relatively shallow coarse sandy loams.

## 5.2.8 Alluvial terraces

The soils associated with the alluvial terraces are variable due to the different parent material and depositional processes in the catchment. Dark duplex soils are the dominant soil type found on the Deep Creek terrace and yellow duplex soils are found on Riddells Creek terraces.

Dark duplex soils  
Factual Key: Dd2.21  
Map Unit: Qa1  
Plate 20

Dark duplex soils with hardsetting clay loam topsoils overlying a clayey subsoil occur on the terraces. They are often mottled and well structured throughout. Nutrient status increases in the subsoil although phosphorus levels are deficient. The subsoil is highly dispersive (see Plate 20).

## 5.2.9 Colluvial fan undulating rises

This large area of colluvial fan occurs north of Lancefield. The common soil occurring in this map unit is a yellow duplex soil.

Yellow duplex soils  
Factual Key: Dy3.41  
Map Unit: Qff  
Plate 21

The soils found on the colluvial fans are yellow duplex. The textures range from a clay loam topsoil to a clayey subsoil. The profile is imperfectly drained which is indicated by the presence of an A2 horizon and an extensively mottled subsoil. The soil is generally acidic and toxic in aluminium. The subsoil is non-dispersive.



**Plate 1 Yellow duplex soil (Dy3.11)**



**Plate 2 Yellow duplex soil (Dy3.21)**



**Plate 3 Yellow duplex soil (Dy3.41)**



**Plate 4 Uniform silty clay (Uf4.3)**



**Plate 5 Uniform clay loam (Um6.14)**



**Plate 6 Red duplex soil (Dr3.22)**



**Plate 7 Red duplex soil (Dr3.42)**



**Plate 8 Brown duplex soil (Db2.11)**



**Plate 9 Yellow duplex soil (Dy3.11)**



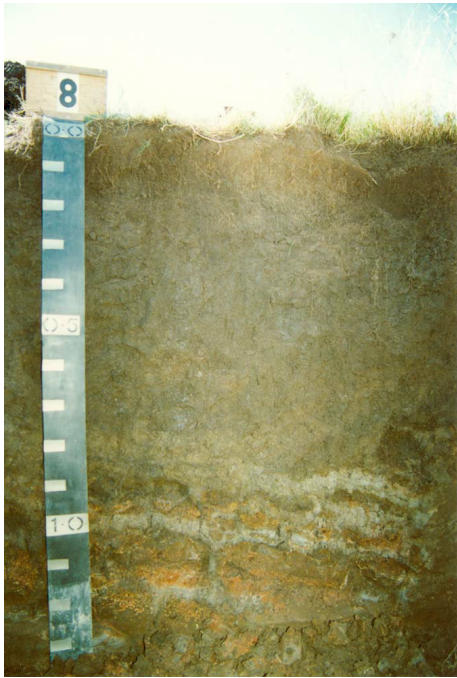
**Plate 10 Yellowish brown gradational soil (Gn4.51)**



**Plate 11 Dark reddish brown gradational soil (Gn3.11)**



**Plate 12 Yellow duplex soil (Dy2.3)**



**Plate 13 Dark duplex soil (Dd1.12)**



**Plate 14 Brown duplex soil (Db1.12)**



**Plate 15 Brown duplex soil (Db1.12)**



**Plate 16 Dark gradational soil (Gn4.42)**





**Plate 17 Uniform silty loam (Um1.14)**



**Plate 18 Uniform silty loam (Um1.44)**



**Plate 19 Yellowish red gradational soil (Gn3.51)**



**Plate 20 Dark duplex soil (Dd2.21)**



**Plate 21 Yellow duplex soil (Dy3.41)**