

Association 4

Soils Associated with Devonian Granite Rocks

Geology

Middle to Upper Devonian igneous intrusions of approximately 370-390 m.y. of age. This period of activity formed what are today the Strathbogie Plateau east of Seymour, the Black Range complex west of Buxston, the granite intrusion on Mount Disappointment and the Cobaw intrusion west of Pyalong. In all the area comprises some 1650 sq km, approximately 23% of the study area. Surrounding these granite intrusions are the metamorphic aureoles and contact metamorphic rocks of hornfels and spotted mudstone which can extend 2 km or more from the origin.

Lithology

The material comprises fine to medium grained porphyrite granodiorite and granite. The Strathbogies are predominantly granite whereas the other intrusion are of granodiorite origin.

The units also incorporate granitic scree and tan deposits with minor areas of alluvial deposition. South of Mount Tanglefoot and stretching to Mount Strickland a small area of biotite dykes has been included.

Soils

There are three principle soil forms found in this geological grouping.

- 1) Deep red well structured, very friable uniformly fine textured to slightly gradational profiles. These profiles occur in the Mount Disappointment-Hume Range, area.
- 2) Deep stoney, gravelly and sandy apedal pale brown sometimes mottled, gradational profiles in the Tallarook State Forest area.
- 3) Moderately deep to shallow, pale brown to yellow, very gravelly gradational earths which occur in areas north of Yea and east of Pyalong.

1. *Soils about Mount Disappointment*

Typically, areas show limited surface boulders. The upper 30 cm is a brown to light reddish brown friable and soft, moist crumb structured light clay, and sometimes clay loam texture. Very fine structured light clay, and sometimes clay loam texture. Very fine quartz sand grains occur, but they are not usually detectable in field texture estimations. Beyond 30 cm and to a depth of about 90 cm there is a very diffuse transition in colour to a light yellowish red. Textures are maintained or show only a slight increase in grading.

Structure becomes more coarse to strong subangular blocky while the friable nature of the soils fades somewhat. In some areas, where tree roots have been exposed following logging activities and where the accompanying soil has dried out, the soil mass exhibits a fine to medium (<5 mm) hard granular structure. Beyond 90 cm soils become redder taking on a dusky red to dark red colouring. Structures are a moist friable strong angular blocky form with rough-faced fabrics. Textures are commonly a light to light medium clay. With depth the sandy nature becomes more obvious but not always perceivable in Land textures.

The soils do not slake rapidly but once wetted, tend to gradually fall apart. Generally the friable, well structured nature allows the soil to be very permeable and well drained. Compaction along tracks and culverts quickly restricts water infiltration.

Some upslope soils tend to be shallower, boulders become more common with soils taking on type (2) and type (3) forms.

2. *Soils within the Tallarook State Forest*

Generally the areas have a more open vegetation form and the presence of numerous rocks and boulders is common. Surface horizons are usually very shallow (<3 cm), very dark greyish brown to

dark yellowish brown apedal, coarse, very sandy loam. Within the upper 30 cm, soils take on a strong brown, very sandy massive silty to sandy clay. This horizon when wet is particularly unstable and slakes quickly. When dry this layer exhibits a very strong hardsetting consistence and commonly takes on a bleached appearance. Beyond 30 cm to a depth of at least 150 cm, soils are mottled with apedal to weakly angular blocky structure and appear very pale brown to pale yellow sandy clays. The mottling may be by way of yellow streaking or an increase in red blotching to where the whole horizon takes on a red hue. The horizon has increased gravel content with quartz gravels from 10% to 50%. On occasions this may go as high as 90%. The horizon quickly grades into a decomposing chalky bedrock material or directly onto hard granitic boulders. The areas are particularly prone to land degradation due to their sand surfaces. Often the surface layer is absent where rock is close to the surface. Soil permeability is poor due to the spewy silty layer. Subsoils exhibit high to moderate slaking in the field and when disturbed, quickly loose structure and become impermeable.

In some cuttings these soils exhibit severe batter rilling with the increased gravel contents becoming obvious.

3. Soils to the north of Yea and east of Pyalong

These areas are usually very stoney with the surfaces covered with numerous boulders and granitic tors. The areas typically lack tree cover with only scattered eucalypts and acacias present. The areas have volunteer pastures which are often sparse with the result that bare areas are common, particularly so around the base of the granite tors.

The surface horizon is a shallow (5 cm thick) very dark grey apedal, very coarse, loamy sand which when dry has little to no coherence. This is immediately underlain by an apedal pale brown coarse sandy and silty clay which is hard and bleached when dry. The material forms a hard pan surface on secondary roads following erosion of the natural surface. When wet, batters are unstable due to rapid slaking of the silty clay. With depth (generally beyond 20 cm-30 cm) a light yellowish brown light clay predominates which is weakly structured and which is unstable when wet. A gradual greying in colour occurs with depth as does the introduction and build up of reddish mottling. All subsoils are impermeable and exhibit fine cracking when exposures dry out. Consistencies of subsoil clays are moderately plastic, very firm, slightly sticky when moist.

The soils overlie a decomposing, sometimes powdery granite often at about 80 cm.

Classification		Texture		Structure		Permeability		Depth to Bedrock	Subsoil Slaking Tendency	Inclusions
PPF	USC	Surface	Subsoil	Surface	Subsoil	Surface	Subsoil			Gravel, Stone, Other
Soils Type (A) Uf 6.1 Gn 4.1	CL	Light clay Some clay loam	Light to medium clay	Strong crumb clay	Strong friable angular blocky	Very good	Very good	Generally >120 cm	Moderate	At depth some granitic stones common. Some areas show incorporated sand beyond 90 cm.
Soils Type (B) Gn 4.5 Gn 4.6	SC (GC)	Sandy loam; A ₂ horizon a silty clay loam	Sandy clay	Apedal	Apedal	Good (A ₂ horizon when wet becomes spewy and impervious to hydraulic movement, hardpan when dry)	Poor to very poor	Often >150 cm	Moderate to high	Gravels (Qtz) are common throughout with levels often in the range 10-50%. On occasions this may rise to 80%. Sand normal throughout.
Soil Type (c) Dy 3.6 Dy 3.7	SC	Loamy sand (A ₂ horizon a sandy and silty clay)	Light clay (with sand)	Apedal	Apedal (some weak subangular)	Poor (A ₂ horizon very poor blocky areas)	Very poor	Generally >80 cm	Rapidly throughout Roadside cuttings very unstable	Sand and granitic inclusions. Large granitic rocks may be encountered at any depth.