

Natural History Cranbourne

Climate

The climate is virtually frost free and slightly cooler than Melbourne. The rainfall is approximately 680 – 715 mm per year but more variable in distribution than in Melbourne. Strong winds are a feature of the site. An official meteorological reporting station is established in the Garden. Data collected at the site is available for a fee from the Bureau of Meteorology. Telephone (03) 9669 4916

e-mail climate.vic@bom.gov.au Website www.bom.gov.au

Geological History

The major geological formation of the site is a Pleistocene to Recent sand deposit, known as Cranbourne Sand. These sands were deposited over the last 100,000 years during the Ice Ages. The more recent sand dunes were deposited during the last Ice Age (25,000 – 8,000 years ago).

These silicious sands are made up of silica particles derived from granite parent material which millions of years ago was further north of Cranbourne. The Cranbourne Sand was formed through runoff and breakdown of those distant granite hills into river systems.

Geomorphology

When the last Ice Cap was at its peak (around 20,000 years ago), the seas drained from the areas now occupied by Port Phillip Bay and Westernport Bay. The Yarra River carved a deep valley and then flowed out through the heads into what is now Bass Strait.

The dry sands from the former seabed were then blown into dunes across the land to the east, including the site of this Garden. Grasslands subsequently spread across this open, flatter country.

Silurian shales and sandstones form the bedrock of the site over which the Cranbourne Sand has subsequently blow. Clay loam soils have developed from these Silurian sediments where they are exposed in the southern and western parts of the Garden.

Approximately 8 500 years ago the climate warmed and the associated rise in sea level flooded Port Phillip and Westernport Bays once again. Heathlands and woodlands became established on the old sand dunes and swamplands developed in the low-lying areas between the dunes. Most of these natural communities have subsequently been cleared since white settlement. Now, the Royal Botanic Gardens Cranbourne conserves some of the few remaining examples of these vegetation types.

Today the land varies from 70 – 120 metres above sea-level and its highest point (Trig Point) provides good views of the Dandenong Ranges, Great Dividing Range and Western Port Bay.

Soils

The two different geological deposits have formed into different soil types.

Basically the Cranbourne Sand has formed into podzol soils and the Silurian sediments have formed into sandy loam (Narre Clay Loam).

Cranbourne Sand

Podzol

The sandy soils derived from the Cranbourne Sand deposits have extremely low fertility, and are characteristically low in calcium, magnesium, nitrogen and phosphate, and are acidic. They are an example of a uniform soil. This is the main soil type in the Garden, being particularly found on the crests and slopes.

The depth of this sandy soil over the clay base varies, leading to variations in moisture and nutrient levels, and so influences the amount of tree cover.

Humic Podzol

In the swales between the dunes, greater amount of organic matter accumulates forming a soil type termed a humic podzol, which has an organic, coarse, sandy clay-loam surface soil. The water table depth varies in these depressions and can range from 80cm below the surface to pools of water 50 cm deep.

Coffee Rock

Over many years, the sandy soils in the swales between the sand dunes have developed an impervious layer. This impervious layer can sometimes be seen in eroded sand dune areas as an ochre coloured thin layer and because of this colour is also known as 'coffee rock'. It is created by the accumulation of humus material washed from the upper layers and iron minerals which are leached from the soil surface and concentrated at lower levels where reaction with organic compounds creates these concentrations sometimes known as 'false rock'. This impervious layer creates the unusual phenomenon of natural swamplands within sand areas. There are several good examples of these "perched swamps" in the Royal Botanic Gardens Cranbourne, although because they are very fragile, access to them is restricted to the Perched swamp off the Tea-tree track.

Sandy (Narre Clay) loam:

The soil that has been derived from the Silurian sediments is higher in organic content and has a higher nutritional value and water holding capacity than the Cranbourne Sands and so supports different vegetation. This more fertile soil type has a higher clay content than the Cranbourne Sands and is sometimes termed the Narre Clay Loam.

The soils derived from the Silurian sediments are mainly found in the southern and western parts of the Garden.