



SOIL MONOLITHS, SOIL VARIABILITY AND TERROIR

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Abstract

Aim: The aim of this work is educating people about soil variability and terroir. Soil monoliths are used to educate the wine industry about how to describe a soil profile, interpret the soil formation processes operating in a particular soil profile and consequently the impact of soil properties on vine growth, fruit quality and wine production. Soil monoliths are a permanent artistic tool for educating, research and management of soil variability.

Method and Results: Soil profiles have a unique genetic combination of layers resulting from physical, chemical and biological processes in a landscape. Soil monoliths are permanent intact visual artistic examples of the changes in a landscape and reflect the history of soil development in unique locations. Three examples are presented from a property on Western Fleurieu Peninsula South Australia. The property is 40 ha, has average rainfall 500 mm, no water supply and elevation ranging from 80 m to 140 m above sea level. It is proposed to establish a portion of the property to bush vines. Soil monoliths and one open soil pit show the key soil types. Soil 1 consists of 40 cm sand over massive yellow-brown sandy clay (Sodosol – Australian Soil Classification). Soil 2 consists of sandy clay loam over red structured clay mixed with soil carbonate (calcic Red Chromosol – Australian Soil Classification). Soil 3 consists of dark sandy clay loam over soil carbonate and calcareous weathered shale (Calcarosol – Australian Soil Classification). Planting of bush vines is being considered for Soil 2. This soil is at 90-100 m elevation above sea level with a north-west aspect. There is no water supply and the vines will need to be established dry grown. Readily available water holding capacity (RAW) for the soil is 45 mm and rootzone 60 cm. This site has a friable angular blocky structured B horizon allow water and vine root penetration. There is no saline soil or major soil carbonate limitation that occurs with Soil 1 and Soil 3 respectively.

Conclusions: Soil monoliths are a permanent intact section of soil that can be used for education, artistic display, research and management of soil changes over time. They can be collected from all parts of a landscape to show soil variability and terroir.

Significance and Impact of the Study: Soil profile characterisation is essential to all forms of agriculture and horticulture. Understanding how soil variability impacts on vine root growth, fruit quality and wine production is the essence of Terroir. Soil monoliths are a permanent, intact representation of soil variability and are useful for education, research and management of soil. They are artistic and can convey the importance of soil properties in a visual, tactile manner.

Keywords: Soil monolith, soil variability, soil profile description, soil horizon, field hand texture, soil structure



Kew Wetherby Soil

Soil Monoliths, Soil Variability and Terroir

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Background and Definitions

Soil profiles have a unique genetic combination of layers resulting from physical, chemical and biological processes in a landscape. The height and aspect in a location influences climate, vegetation, water and nutrient movement. Parent material either rock or sediment is the starting material for soil formation. These factors create **soil variability** and predicting the different soil types in a landscape is the basis of **soil mapping**. More recently human activity has also shaped landscapes and soil. **Terroir** is a reflection of changes in landscape and is reflected in vine growth, fruit quality and wine production.

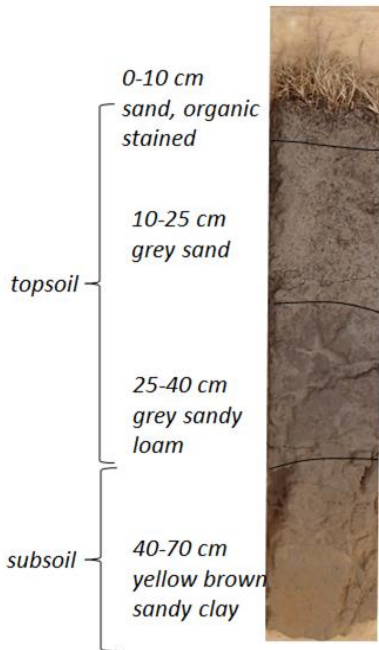
Soil monoliths are permanent intact visual artistic examples of the changes in a landscape and reflect the history of soil development in unique locations.

Aim of this work is educating people about soil variability and terroir. Soil monoliths are used to educate the wine industry about how to describe a soil profile, interpret the soil formation processes operating in a particular soil profile and consequently the impact of soil properties on vine growth, fruit quality and wine production

Soil profile variability

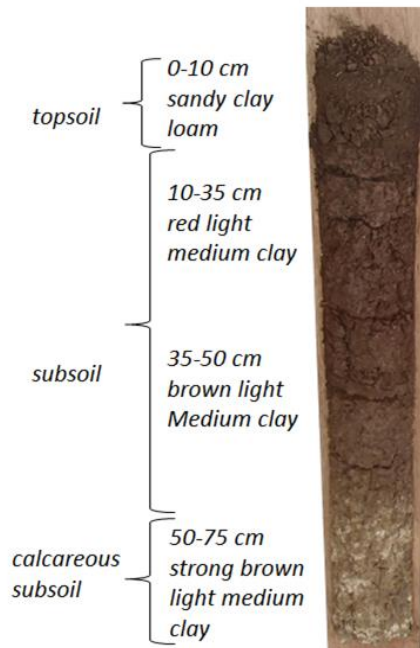
Soil 1

Formed from glacial deposits. The soil profile consists of sand over yellow-brown sandy clay (Sodosol – Australian Soil Classification).



Soil 2

Formed from colluvium deposition from upslope mixed with aeolian soil carbonate. The soil profile consists of sandy clay loam over red structured clay mixed with soil carbonate (calcic Red Chromosol – Australian Soil Classification).



Soil 3

Formed from calcareous shale rock. The soil profile consists of brown sandy clay loam with crumb structure formed between rock fractures above a "C" horizon of weathered shale rock at 50 cm (Calcarosol – Australian Soil Classification).



Discussion. Planting of bush vines is being considered for Soil 2. This soil is at 90-100 m elevation above sea level with a north-west aspect. There is no water supply and the vines will need to be established dry grown. Estimated readily available waterholding capacity (RAW) for the soil is 45 mm (Kew et al 2004). There is no saline soil or soil carbonate limitation that occurs in Soil 1 and Soil 2 respectively. Vine roots, once established should penetrate to a depth of 70 cm from the surface. Planting rows will follow the contour and be mounded.

Conclusions

Soil monoliths:

- are permanent intact sections of soil that can be used for education, artistic display, research and management of soil
- they can be collected from all parts of a landscape to show soil variability and terroir

More Information

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