The Soils of Margaret River

The Margaret River Wine Region is renowned for the deep and ancient gravel-loam duplex soils of the Leeuwin Complex ridge, which are crucial to producing wines of distinction, consistently. These free-draining soils have low water and nutrient holding capacities, providing the optimum growing conditions to achieve balance between foliage and fruit, and thus superb aroma and flavour intensity. Typically, these soils sit upon a clay base which supports the vines during the dry summer growing season. The predominance of ironstone gravel soil types in the south-west of Western Australia is not seen anywhere else in the world.

SELECTING VITICULTURE LAND

One of the most distinguishing features of the soils of Margaret River is the extent of change that occurs across the region and how frequently they can transition, even across a single block of vines. In many vineyards, the soil profile can alter significantly within a matter of metres. This landscape allows vignerons to match grape varieties by row and produce an array of wine styles over small land areas.

Since the earliest days of viticulture in the Margaret River Wine Region, the specific preference towards land cloaked in the Jarrah, Marri and Karri trees (Eucalyptus marginata, Corymbia calophylla and Eucalyptus diversicolor) has guided vignerons as to what lies under the surface of adjacent paddocks, many of which were cleared by farmers before the wine industry. Given the complex nature of the landscape, many modern vignerons have utilised comprehensive soil surveys for pairing varieties to vineyard blocks and rows. Surveys may use soil classification maps, precision viticulture technologies such as infrared mapping, soil sampling and/or excavated soil test pits to identify the best land for planting.

At one stage in the industry there was a distinct focus on using precision viticulture technologies to increase uniformity in the vineyard, particularly regarding soil management and subsequent water management strategies. Due to the complex distribution of soil types within the region, this was not an easy task. In recent times, viticulture programs are adapting to the variability of soil type at a row and block level, and embracing the benefits of this approach.

"As far as we have been able to ascertain, there are no other wine growing areas around the globe that have soils so broadly dominated by lateritic ironstone gravels. The gravels have definitely been sought out by vignerons, as by our estimates, they account for over 40 percent of all plantings in the state (Western Australia)."

Peter Tille & Angela Stuart-Street
Soil Scientists

A DIVERSITY OF SOIL TYPES

Ten main soil type groupings have been identified in the Margaret River Wine Region. Forest Grove (ironstone gravels) make up the highest percentage of vineyard area at 45 percent, and Mungite (sandy duplex) soils are next, at 29 percent. A number of the other soils present are not suitable for viticulture and are not planted to grapevines.

Many of the region's vineyards are established on a patchwork of different soil types and this feature can be managed towards an advantage, as well as celebrated. In fact, a significant degree of the complexity found in Margaret River wines can be attributed to the influence of soil diversity within a single variety block.

The difficulty with mapping the main soil types of Margaret River is that they do not form discrete units of land area. Rather, soil profiles merge across the landscape creating a mix of soil types as they transition. The Margaret River 'Main Soil Types' map illustrates the dominance of particular soil types and combinations thereof. The legend, which references local soil names, describes how the soils blend across the topography of the region.

MAIN SOIL TYPES

FOREST GROVE SOILS DOMINANT (WITH MINOR KEENAN SOILS)
Ironstone gravelly soils occur across more than half of these areas and about a quarter of the soils are red–brown loams.

FOREST GROVE SOILS (WITH MUNGITE SOILS COMMON)
Ironstone gravelly soils occur across more than half of these areas and about a quarter of the soils are red–brown loams.

MUNGITE AND FOREST GROVE SOILS CO-DOMINANT
Sandy duplex and Ironstone gravel soils are equally common.

BUSSELTON, ABBA AND WATERLOGGED SOILS
Sandy duplex and seasonally wet soils are equally common.

MARYBROOK SOILS (WITH BUSSELTON SOILS)
Mainly alluvial sands and loams with some Sandy duplex soils.

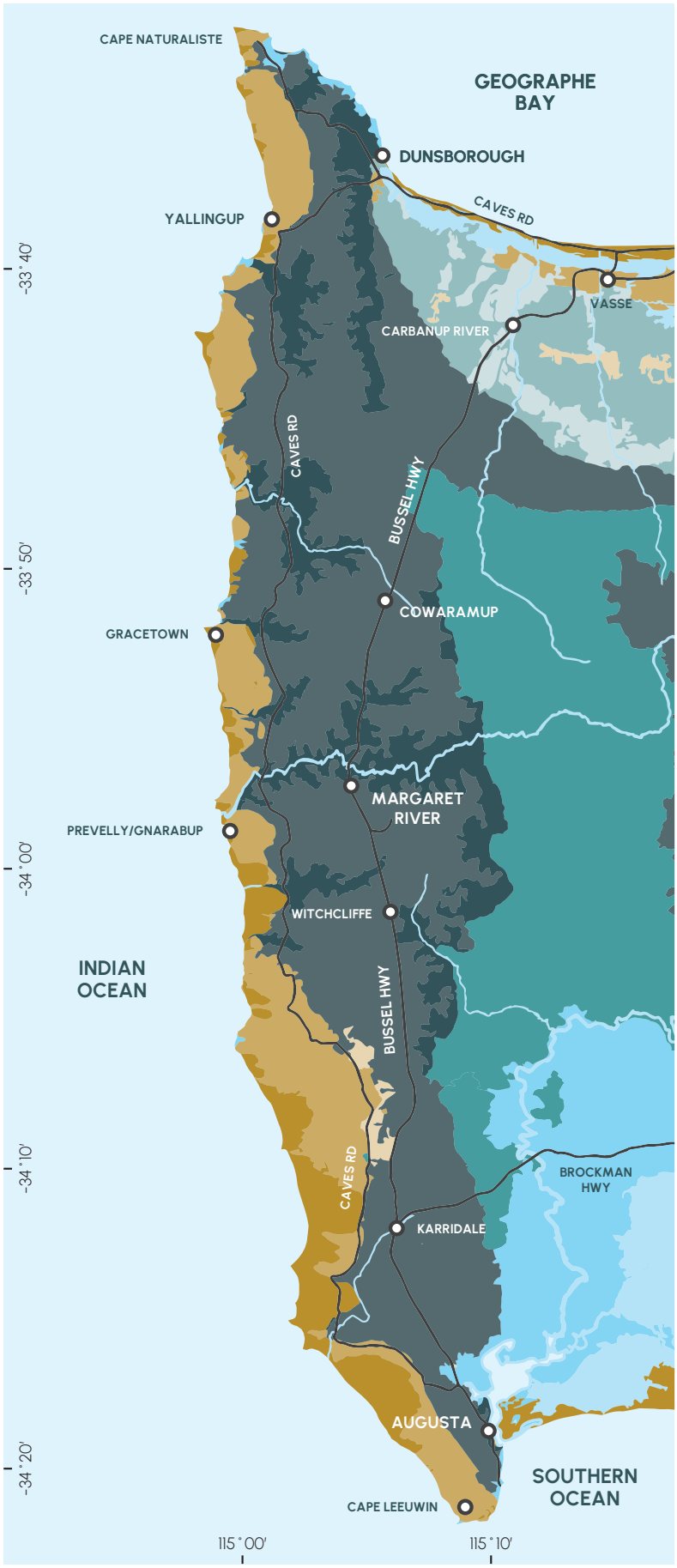
SPEARWOOD & OTHER YELLOW SANDS DOMINANT
Coloured sands are dominant.

BLEACHED SANDS DOMINANT
Pale deep sands make up most of the soils.

CALCAREOUS SANDS DOMINANT
Calcareous (alkaline) sands make up most of the soils.

MOSTLY WATERLOGGED SOILS
Most of the soils are affected by seasonally high watertables and other wet areas.

WATERLOGGED SOILS, MUNGITE SOILS AND YELLOW SANDS
Waterlogged soils mixed with areas of sandy duplex and Yellow deep sands.



MAIN SOIL TYPES

- Town
- Major Road
- Rivers & Waterways

- Forest Grove soils dominant (with minor Keenan soils)
- Forest Grove soils (with Mungite soils common)
- Mungite & Forest Grove soils co dominant
- Busselton, Abba and waterlogged soils
- Marybrook soils (with Busselton soils)
- Calcareous sands dominant
- Spearwood & other yellow sands dominant
- Bleached sands dominant
- Mostly waterlogged soils
- Waterlogged soils, Mungite soils and yellow sands

0 10
KILOMETRES

FOREST GROVE SOILS

IRONSTONE GRAVELS

Many of the region's earliest grape-growing sites were planted on the hills and valleys which transect the region, where Forest Grove soils are the most commonly occurring classification. Gladstones (1966) noted that these soils supported, "a predominance and good growth of Marri," and recommended them as most suitable for wine production. These soils represent only a quarter of the region's cleared land; however, a notable 45 percent of the Margaret River Wine Region's vineyards sit upon them.

"Today, Margaret River has more than 160 producers, on wildly varying soils, of which free-draining ironstone gravels are most prize for the region's exceptionally fine reds"

Hugh Johnson & Jancis Robinson MW

Forest Grove soils encourage well-balanced vine growth due to lower inherent fertility, and low-to-moderate available water. They are the shallowest soils of the region, with clay and rock bases generally restricting root growth and moderating vine vigour. Iconic quality Cabernet Sauvignon and Chardonnay fruit is grown on these soil types.

The soils in this group consist of lateritic colluvium derived from a deeply weathered mantle, overlying clay or ironstone parent material. They are gravelly soil profiles ranging from yellow-brown, sandy loam duplexes through to red-brown gradational loams with up to 60 percent ironstone gravel content. The underlying clay can be highly variable, from deep, white sandy clay, to mottled yellow clay, and in the shallowest soils, red gravelly clay. The topsoil is composed of a varying mix of sand and loam, usually with some degree of surface gravel. This exposed ironstone component retains heat, which is radiated into the fruit zone, enhancing the vine's ripening potential. Waterlogging is generally not a problem with this soil type due to the soils' prevalence on slopes.

"These ironstone gravels are of pedogenic origin, that is, they have formed within the soil. This is a strong point of difference with other regions, particularly those in Europe, where gravelly soils comprise fragments of quartz, quartzite, limestone, basalt, flint and other rocks."

Peter Tille & Angela Stuart-Street
Soil Scientists

MUNGITE SOILS

SANDY DUPLEXES

Mungite soils are the second most widely planted classification in the Margaret River Wine Region and are often mixed with Forest Grove soils. Well-drained Mungite soils with gravel in the profile are suitable for most grape varieties.

Reasonable yields can be supported on the better Mungite soils due to good water and nutrient holding capacities. Good irrigation and nutrition management is commonly used to keep vines in balance. Often vineyards with these soil types require surface and subsurface drainage prior to planting.

Mungite soils are sandy earth soils with varying compositions of loam and gravel. The depth to clay can be highly divergent, ranging from shallow soils with clay at 60 centimetres, to deep sands with clay at 1.5 metres or more. The topsoil is generally a grey-brown colour composed of fluctuating ratios of sand and loam, and often containing a small percentage of gravel.

OTHER SOIL TYPES

More recently, vines have been planted in the north-east of the region on Marybrook (alluvial) soils. These soils are mainly located in warmer, northern areas of the region and are adaptable to many varieties. The Marybrook soils have excellent water and nutrient holding capacities, and vines grow strongly due to the large potential rooting volume and available water. Vines can produce large canopies and high yields with the correct trellis system. These soils are comprised of red, sandy earth and friable red-brown loamy earth. They have formed relatively young, well-drained alluvium and have a fine, red sand to loamy topsoil, sometimes grading to clay with depth.

Some of the region's deeper, well-drained sandy soils are also suitable for wine grape production, namely the Keenan, Busselton and Spearwood sands.

"Margaret River's reputation has been built on Cabernet Sauvignon with usefully ripe tannins, and often, a hint of something marine – oyster shells? It joins such other west coast wine regions as Bordeaux, Bolgheri, Napa/Sonoma, and the Limestone Coast in its propensity to turn the rays of the setting sun into some of the most satisfying, and ageworthy, red wines in the world. There is both finesse and ripeness in Margaret River's best Cabernets"

Hugh Johnson & Jancis Robinson MW

Sources

Tille P & Stuart-Street A, (2020), Wine Industry Newsletter, DPIRD Bunbury https://www.agric.wa.gov.au/newsletters/win/win-vol-134

Tille, P, Stuart-Street, A & Gardiner, P 2020, Geology, Soils and Climate of the Margaret River Wine Region, Department of Primary Industries and Regional Development, Perth. https://researchlibrary.agric.wa.gov.au/pubns/150/

Johnson H & Robinson J (2019) The World Atlas of Wine, 8th Edition