

THE IMPORTANCE OF GEOLOGY IN VITICULTURE: THE EXAMPLE OF SÃO JOAQUIM, SANTA CATARINA

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SUMMARY: The geology of São Joaquim is composed by low-Ti basaltic andesites of Gramado type, low-Ti dacites and rhyolites of Palmas type, Caxias do Sul subtype, and high-Ti sills with basaltic composition of Urubici type from the Serra Geral Formation (Paraná Magmatic Province), that are part of a volcanic sequence with approximately 700 meters. Why is that important to viticulture? (1) For each 100 meters in altitude the temperature decreases 0.6 °C, hence without these rocks the local temperature would be at least 4.2 °C warmer; (2) The hilly relief of the region is associated with basaltic rocks and the flat relief situated in the upper part of the landscape is related to dacitic and rhyolitic rocks; and (3) If the soils were derived from the sandstones of the Botucatu Formation (situated below the Serra Geral Formation) they would have a completely different texture. The soils in São Joaquim are predominantly Humic and Haplic Cambisols, both *Alíticos*, and Leptosols; but what is considered the best soil for viticulture? For many authors the soil must have a loam to clay loam texture, good drainage, pH between 5 and 6, organic matter content higher than 20 g/kg and minimum depth of 60 cm. All soil profiles analyzed in this study presented clay to very clay texture, due to the weathering processes that acted on these volcanic rocks with aphanitic texture and generated soils with fine texture. However, in all evaluated profiles a well-developed structure with granular aggregates (Horizon A) and angular to subangular blocks (Horizon B) was observed, which favors the presence of pores and thus, good drainage. What probably will lead to drainage problems in these soils is the presence of some limiting layer to the passage of water, such as lithic contact or textural gradient. Only the soils derived from basalts presented the pH within the appropriate values (average of 5.52). The soils derived from dacites exhibited an average pH of 4.66; and from rhyolites, an average of 4.70. The organic matter contents of all soils are higher than the minimum required for viticulture. The soils derived from basalts showed an average organic matter content of 61.28 g/kg; from dacites, an average of 66.23 g/kg; and from rhyolites, an average of 47.26 g/kg. These high organic matter content values are associated with the climate and source material. The colder climate throughout the year reduces the rate of decomposition of plant residues causing the organic matter to accumulate and interact with the mineral part of the soil forming organomineral complexes. With the exception of one soil profile derived from rhyolites that has lithic contact within 37 cm, all the soil profiles analyzed exhibited sufficient thickness for the development of the vine root system. In general the deeper soils are the ones derived from basalts. This is a work in progress, but with the data gathered until now it is possible to assert that, in São Joaquim, the soils derived from basalts are the best suitable for viticulture.

KEYWORDS: SÃO JOAQUIM; SERRA GERAL FORMATION; VITICULTURE.