SPATIAL VARIABILITY OF INCEPTISOL AND ENTISOL SOILS AND THEIR EFFECT ON MERLOT GRAPE MUST COMPOSITION

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ABSTRACT

Brazil imports about 80% of vinifera wines, mainly coming from South American and European countries. To modify this situation, winemakers are employing some modern cultural practices in the vineyards and introducing recent technologies in wine making. However, as far it is known there is no precision viticulture (PV) technology used to improve wine quality in the country, despite the works related to soybean, wheat, corn, and sugarcane, and those carried out in different viticultural regions of the world.

For this reason, researches are being conducted in two different Brazilian geographical and climate regions, i.e., in Rio Grande do Sul, the Brazilian southernmost State (29º S), where grapes for wine and juice predominate, and in the northeast, States of Pernambuco and Bahia (9º S), where growers mainly cultivate table grapes. At this moment, there are no final results of these researches. However, partial results were already presented in symposiums (Flores et al., 2010; Filippini et al., 2011; Miele et al., 2011, Nascimento et al., 2011).

This work was carried out during the vegetative cycle of 2010/2011 in a Merlot vineyard, clone 347, where scions were grafted on the rootstock Paulsen 1103. Grapevines were planted in 2006, 2.5 m x 1.0 m, vertical trellised, cordon trained, spur pruned. Among the technologies related to PV, a subset of them was used in the current work to establish a) soil profiles and soil analyses, which were performed to determine the taxonomic classes of soils and their characteristics, and b) basic physicochemical analyses of the grape musts.

The soil profiles were established with four 1.5 m deep trenches. In each trench, four horizon samples were collected and 27 physicochemical variables were evaluated from each sample. After that, 54 superficial soil samples were collected with a 20 m x 20 m grid and their physicochemical composition was determined. When grapes were matured, in March 2011, berries from 74 grapevines were sampled and placed in a plastic bag. In the laboratory, the juice was extracted and analyzed. It should be mentioned that grapes sampled for juice

analysis were from grapevines near the holes made for soil analysis and georeferenced, that is, latitude, longitude, and altitude of each grapevine were registered.

The results of the profile soil analyses showed that there are two main taxonomic classes of soil in the vineyard, i.e., Inceptisol and Entisol. Applying geo-statistical procedures, such as kriging, the maps show that Inceptisol had lower values of P, K, and Ca (Figure 1), but there were no differences between the two soil classes on organic C, N, and Mg contents. Considering the physicochemical analyses of the must from grapes cultivated on each soil class, it was shown that the must of grapes grown on Inceptisol had higher values of ºBrix, pH, and ºBrix/titratable acidity ratio and lower for titratable acidity. These observations could indicate that grapevines cultivated on Inceptisol produce grapes more suitable for higher quality wines.

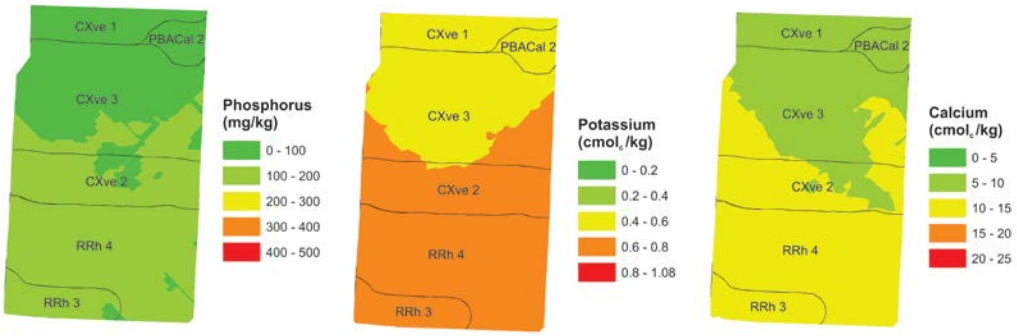

Figure 1. Spatial distribution of P, K, and Ca contents according to the soil taxonomic class. Legend: CXve 1, 2, and 3 = Inceptisol; RRh 3 and 4 = Entisol; PBACal 2 = Ultisol.

REFERENCES

Filippini Alba, J.M., A. Miele, C.A. Flores, C. Pavan, M.L. Fochesato, H. Levien, D.H. Zarnott. 2011. Variabilidade espacial dos atributos físicos e químicos de solo e planta na UP Uva para Vinho, Bento Gonçalves, RS. p. 277-281. *In*, Inamasu, R.Y., J. de M. Naime, A.V. de Resende, L.H. Bassoi, A.C. de C. Bernardi, editors, Agricultura de precisão: um novo olhar. Embrapa Instrumentação, São Carlos, SP.

Flores, C.A., J.M. Filippini Alba, H.F. Levien, D.H. Zarnott, A. Miele, C. Pavan. 2010. Levantamento detalhado dos solos e a viticultura de precisão. p. 1-4. *In*, Anais do XXXIII Congresso Brasileiro de Ciência do Solo, Uberlândia, Brasil. Uberlândia, Brasil: Sociedade Brasileira de Ciência do Solo. CD-ROM.

Miele, A., C.A. Flores, J.M. Filippini Alba. 2011. Status atual da pesquisa de viticultura de precisão no Rio Grande do Sul: primeiros resultados da UP Uva para Vinho. p. 267-272. *In*, Inamasu, R.Y., J. de M. Naime, A.V. de Resende, L.H. Bassoi, A.C. de C. Bernardi, editors, Agricultura de precisão: um novo olhar. Embrapa Instrumentação, São Carlos, SP.

Nascimento, P. dos S., M.G. Rocha, J.A. Silva, B.R.S. Costa, L.M. Rabello, L.H. Bassoi. 2011. Zonas homogêneas de condutividade elétrica aparente em Neossolo Quartzarênico no Semiárido. p. 290-293. *In*, Inamasu, R.Y., J. de M. Naime, A.V. de Resende, L.H. Bassoi, A.C. de C. Bernardi, editors,

Agricultura de precisão: um novo olhar. Embrapa Instrumentação, São Carlos, SP.

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