

## ROOTSTOCK EFFECTS ON CV. *UGNI BLANC* BERRY AND WINE COMPOSITION

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### Abstract:

**Context and purpose of the study** – In the Cognac region in France, Ugni blanc is the most planted grape variety (98% of the 80 500 ha). This vine region is in expansion due to the success of the associated well-known brandy and the need of high grape yield to guarantee the production of base wine for distillation. About 2 to 3000 ha are newly planted each year and rootstocks are one powerful tool for vineyard adaptation to soil or climate change. As rootstocks ensure water and mineral nutrient supplies to the scion, it is important to better understand their effect on berry composition parameters such as sugars and nitrogen compounds, which are the main precursors for fermentary aroma metabolites, the latter being quality markers for Cognac after distillation.

**Material and methods** – This study was conducted in 2021 in the GreffAdapt plot (55 rootstocks x 5 scions x 3 blocks, designed according to soil resistivity) on cv. *Ugni blanc* (Marguerit *et al.* 2019). The effects of thirteen selected rootstocks (1103P, 140Ru, 333EM, 41B, 775P, Evex13-5, Fercal, Georgikon 28, Gravesac, RSB1, Rupestris du Lot, SO4 and Téléli5C) were evaluated on vine vigor, petiolar mineral element concentrations (N, P, K, S, Mg, Ca, Na, B, Zn, Mn, Fe, Cu, Al), berry  $\delta^{13}\text{C}$  as well as berry composition including detailed amino acid profiles at harvest and fermentative volatile contents such as higher alcohols and esters of the corresponding wines, fermented at laboratory scale under standardized conditions similar to Cognac base wine elaboration.

**Results** – Among all the parameters measured on vines, berries and wines, very few vineyard block effects were measured and rootstock effects were the most important. Evex 13-5 had the lowest yield (2,9 kg/vine) as well as the smallest berries (2.6 g/berry) as opposed to 1103P with high yield (5,5 kg/vine) and the biggest berries (3,2 g/berry). Ravaz index (yield to pruning weight ratio) spanned 6.5 to 14.5 and varied significantly between rootstocks. With 2021 being wet and cool,  $\delta^{13}\text{C}$  ranged -28.3 to -25.4‰ showing low to no water deficit conditions. Significant differences between sugar and nitrogen compound levels in the must were observed between rootstocks with low sugar levels spanning 13.6-19.1 °Brix, typical for Cognac base wine production. Differences in amino acid concentrations and proportions were substantial leading to wine with distinct aroma profiles. Relationships between vine characteristics and wine volatiles were not evident, however aroma composition seemed to be linked with must composition and particularly grapes nitrogen compounds but further investigations are required. In this experimental set-up, Evex 13-5 was the least adapted for Cognac production while Fercal showed a high potential with a high yield, a low sugar to acid ratio, a high YAN and produced wines with low levels of higher alcohols and high concentrations of esters.

**Keywords:** Amino acids, Aroma compounds, Cognac, Ugni blanc, Rootstock, Wine for distillation, Yield

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