



Sugar content during maturation of 'Syrah' grapes according to vine fertilization

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The viticulture in the semi-arid region, especially at the São Francisco Valley, Brazil, stands out on the national scene with high yields and high quality of the produced grapes, mainly regarding the sugar content. This fact is due to soil and climatic conditions of the region and the availability of water resources that favors the vine production all over the year. The accumulation of sugar in the grapes is essential for winemaking process, since it is necessary for alcohol production by yeasts, which contributes to wine aroma and taste. The aim of this study was to evaluate the fructose content on Syrah grapes during maturation, according to potassium and nitrogen fertilization on vines. At Embrapa Semi-arid experimental field, in Petrolina, PE, Brazil, Syrah vines, in four blocks and drafted on Paulsen 1103 rootstock, fertilized with 0 (control - Treatment 1) or with 120 kg ha⁻¹ of nitrogen, 120 kg ha⁻¹ of K₂O, as potassium nitrate and urea (Treatment 2) were evaluated from 105 days after pruning and at five stages (points) before harvest, according to the fructose accumulation of the fruit, collecting 50 berries per each treatment and evaluation time. The fructose content determination was realized by HPLC (WATERS, Aliance e2695, with refractive index detector) and the samples were extracted and filtered with a membrane 0,45µm and injected in three repetitions. For the separation, the column Rezex RHM-monosaccharide H + 300 x 7.8 mm was used with a Carbo H, 4.0x3.0mm pre-column. For the mobile phase, ultrapure water was used with an isocratic flow of 0.6 ml min⁻¹ and oven temperature of 40°C. Ten µL of standard and samples were injected and calculations were performed according to the conditions used. According to the results, it is possible to observe a progressive increase in fructose content in berries from both treatments until the point 3 of the maturation curve, with a small decrease on point 4 and followed by a new increase at the end of the maturation curve – point 5. The progressive increase in the fructose concentration of the berries is a function of their growth and metabolism of carbohydrates in the fruit with the advance of maturity, which favors the accumulation of sugars used in cellular respiration, plant growth and then the amount that is not consumed, can be concentrated in the berry. With the progress of the maturation process, the sugars from the photosynthetic process can accumulate in higher amounts and an increase in production by the plant is due to mature leaves and further increase on leaf surface. The slight decrease in the fructose content of the berries can be attributed to changes in weather conditions or the phenological phase controlling plant photosynthesis, influencing the sugar production and transport. However, there was no significant difference between treatments. The means for the fructose content varied from 26.932 to 73.818 mg 100 g⁻¹ for treatment 1 (control) and from 13.382 to 99.906 mg 100 g⁻¹ during the maturation curve. The highest difference between treatments was observed in point 5 of the maturation curve with 26088 mg fructose.100g⁻¹ and the lower at point 4, with the amount of 5452 mg fructose.100g⁻¹ of difference. This data suggest that the available amounts of nutrients in the soil were sufficient to achieve the crop demands, regardless the additional supply of K and/or N. Based on the results, it is possible to conclude that the potassium and nitrogen fertilization in the amount and conditions of this study did not exert influence on the accumulation of fructose during Syrah grapes ripening at the São Francisco Valley, Brazil.

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