

Title Characterizing physiological changes for adjudging maturity indices of 'Thompson Seedless' grapes produced in Sao Francisco River Valley, Brazil

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Abstract

This study characterized the main physiological changes related to maturation, as indicative of an ideal harvest time and a better postharvest conservation for 'Thompson Seedless' grapes in Sao Francisco River Valley, Brazil. Evaluations were done in plants grafted under 'IAC-766', cultivated in Experimental Field of Embrapa Tropical SemiArid, in Petrolina, Pernambuco State, Brazil, using a 3 x 3 m of spacing and drop irrigation. Plants were pruned in May, during a warm station in that region. Three bunches were collected in each experimental unit from maturation beginning, registered at 73 days after pruning, to harvest. The treatments corresponded to the maturation stage of the berries: 0, 7, 14, 17, 21, 24 and 28 days after maturation beginning (dam). The experimental design was in randomized blocks with three replicates. Firmness loss was intense on the first seven days and maintained constant after 14 dam. This response was not associated to pectic substances content and to pectin methyl esterase (PME) activity, which did not show significant statistical changes during the period. However, polygalacturonase (PG) activity increased after 7 dam, reaching a peak at 24 dam, when there were not increases on weight of bunches. The activity of oxidative enzymes related to browning (poly phenoloxidase and peroxidase) was higher at the final stage of maturation, which corresponds to ripening. At harvest, it was observed the highest soluble solids and sugars content (19.1 °Brix and 16.8 g.g⁻¹, respectively), titrable acidity equivalent to 0.87% of tartaric acid and a decrease on PG activity. Related to firmness loss, the increase on PG activity had a secondary importance to the event, suggesting that PME acts before maturation and determines the changes showed in this study. Finally, we consider that a late harvest can promote a continued degradation of organic acids but it can increase the susceptibility to browning.