

PHENOLOGY, THERMAL REQUIREMENTS AND MATURATION OF THE SR 0.501-17 WINE GRAPE HYBRID CULTIVATED IN CONTRASTING CLIMATE

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Abstract:

Context and purpose of this study - The use of hybrids in viticulture is one of the alternatives for sustainable production in hot and rainy regions during grapevine maturation. This sustainable production concerns the reduction of pesticide use, adaptation to climate and control of vine decline. The SR 0.501-17 wine grape hybrid, developed in the grapevine program of the Agronomic Institute of Campinas (IAC), is characterized by producing white grapes with small spherical berries with seeds. The agronomic characterization of this hybrid, especially in different climatic conditions, as well as the evaluation of its performance in winemaking are necessary. The objective of this work was to characterize the duration and thermal requirements of the different phenological stages and the influence of rainfall on the physicochemical characteristics of the must in two contrasting climate regions of the State of São Paulo.

Material and methods - The phenology, thermal requirements expressed in degree-days, soluble solids content and titratable acidity of the hybrid were evaluated during the grape growing seasons from 2012 to 2016, in contrasting climatic conditions at Jundiaí at east and Votuporanga at northwest of the São Paulo State-Brazil.

Results - The average duration of the pruning-harvest period was 146 days in Jundiaí and 131 days in Votuporanga and the average duration of the grape maturation period (beginning of berry softening to harvest) was 29 and 27 days, respectively for Jundiaí and Votuporanga. The thermal requirement expressed in degrees-days for the hybrid growth cycle was 1663 and 1923, and for the maturation period, 390 and 485, respectively for Jundiaí and Votuporanga, SP. Rainfall during the maturation period showed negative correlation with total soluble solids and maturation index and positive correlation with titratable acidity. The effect of temperature on vine growth cycle were more pronounced in Jundiaí in comparison to Votuporanga while the effect of rainfall on the maturation characteristics were more effective in Votuporanga when compared to Jundiaí.

KEYWORDS: cycle duration, degree-days, soluble solids, titratable acidity.

1. Introduction.

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INTRODUCTION and OBJECTIVES

The use of hybrids in viticulture is one of the alternatives for sustainable production in hot and rainy regions during grapevine maturation. This sustainable production concerns the reduction of pesticide use, adaptation to climate and control of vine decline. The SR 0.501-17 wine grape hybrid, developed in the grapevine program of the Agronomic Institute of Campinas (IAC), is characterized by producing white grapes with spherical berries and small fruits with seeds. The better agronomic characterization of this hybrid, especially in different climatic conditions, as well as the evaluation of its performance in winemaking are necessary. The objective of this work was to characterize the duration of the different phenological stages of the thermal requirements and the influence of rainfall on the physicochemical characteristics of the must in two regions of the State of São Paulo.

MATERIAL AND METHODS

- Climate regions: Cfa and Aw
- Years: 2012 and 2016
- Cultivar: SR 0.501-17 grafted onto IAC 756 'Campinas'
- Experimental design: blocks with four replicates
- Variables evaluated: soluble solids content (SS), titratable acidity (TA) and Maturation index (MI) was calculated; Phenological stages: P-B: Pruning - Budburst; B-F: Budburst - Flowering; F-M: Flowering - Beginning of maturation; M-H: Beginning of maturation - Harvest.
- Statistical Analysis: linear regression analysis using the least square method while the comparison between most physicochemical characteristics and total rainfall in the maturation period was evaluated by the correlation coefficient. The comparison of mean of physicochemical characteristics of the grapes - "U" test of Mann-Whitney at 5% probability level.

RESULTS

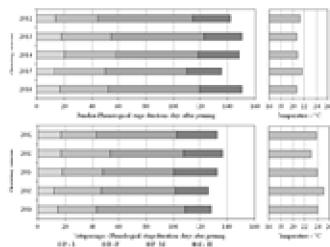


Figure 1. Phenological subperiods duration of the white grape hybrid SR 0.501-17 and average temperature for different growing seasons at Jundiá and Votuporanga counties, São Paulo State, Brazil

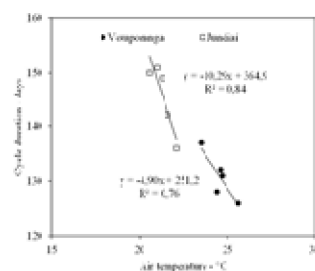


Figure 2. Relation between cycle (y) duration (pruning to harvest) of the white grape hybrid SR 0.501-17 and mean air temperature (x) for Jundiá and Votuporanga counties, São Paulo State, Brazil

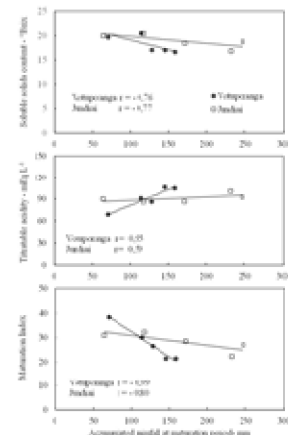


Figure 3. Correlation between most physicochemical characteristics of the white grape hybrid SR 0.501-17 and accumulated rainfall during the maturation period for Jundiá and Votuporanga counties, São Paulo State, Brazil.

CONCLUSIONS

- The vine growth cycle duration was higher in Jundiá when compared to Votuporanga being respectively, 146 and 131 days. In Jundiá the effect of the air temperature on the cycle duration is more pronounced in Jundiá than comparison to Votuporanga.
- The thermal requirement expressed in degree days for the vine growth cycle was higher in Votuporanga (1923) compared to Jundiá (1653).
- The correlation coefficient of the comparison between most physicochemical characteristics and rainfall occurred during the maturation period was negative for soluble solids content and maturation index and positive for titratable acidity in both locations being more pronounced in Votuporanga in comparison to Jundiá.

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