

ATMOSPHERIC MODELING: A TOOL TO IDENTIFY LOCATIONS BEST SUITED FOR VINE CULTIVATION. PRELIMINARY RESULTS IN THE STELLENBOSCH REGION

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The choice of sites for viticulture depends on natural environmental factors, particularly climate, as grapevines have specific climatic requirements for optimum physiological performance and berry quality achievement. In the Stellenbosch wine-producing region, the complex topography and the proximity of the ocean create a variety of topoclimates resulting in different growth conditions for vines within short distances.

The Regional Atmospheric Modeling System (RAMS) was used to perform numerical simulations over the South Western Cape, for a period of 18 days during grape ripening (February 2000). Four 4 nested grids (25 km, 5 km, 1 km and 200 m of resolution) were used, the coarse grid being the computational domain (taking the large scale circulation into account), while the finest resolution (200m) focused on the vineyards south of Stellenbosch (taking the local circulations into account) in order to extrapolate climatic data at a fine scale. Data from the analysis file were extracted and remapped using the climatic thresholds for viticulture, thereby making the meso-scale atmospheric modeling system applicable to grapevine cultivation. Temperatures were grouped into different ranges that would affect the physiology of the vine.

These preliminary results identified locations near Stellenbosch according to the thermal stresses for specific days as well as their potential to meet the climatic requirements for optimum physiological performance of the vine. Three typical weather situations are described at the peak of the photosynthetic performance period (12:00), using results of the two finest grid resolutions (1 km and 200 m). Modeled hourly data were extracted from the analysis file in order to calculate the mean hourly temperature fields for a 16-day period (1-16 Feb 2000) and the mean data were then reintegrated into a GIS as an additional descriptive variable useful for terroir identification.