Filipe Adão*, João A. Santos, Helder Fraga, Aureliano C. Malheiro

Assessment of grapevine sap flow and trunk diameter variations in Mediterranean climate using time series decomposition

Affiliation
Centre for the Research and Technology of Agro-Environmental and Biological Sciences, CITAB, University of Trás-os-Montes and Alto Douro, UTAD, Vila Real, Portugal

Correspondence
Filipe Adão*: filipeadao@utad.pt, João A. Santos: jsantos@utad.pt, Helder Fraga: hfraga@utad.pt, Aureliano C. Malheiro: amalheir@utad.pt
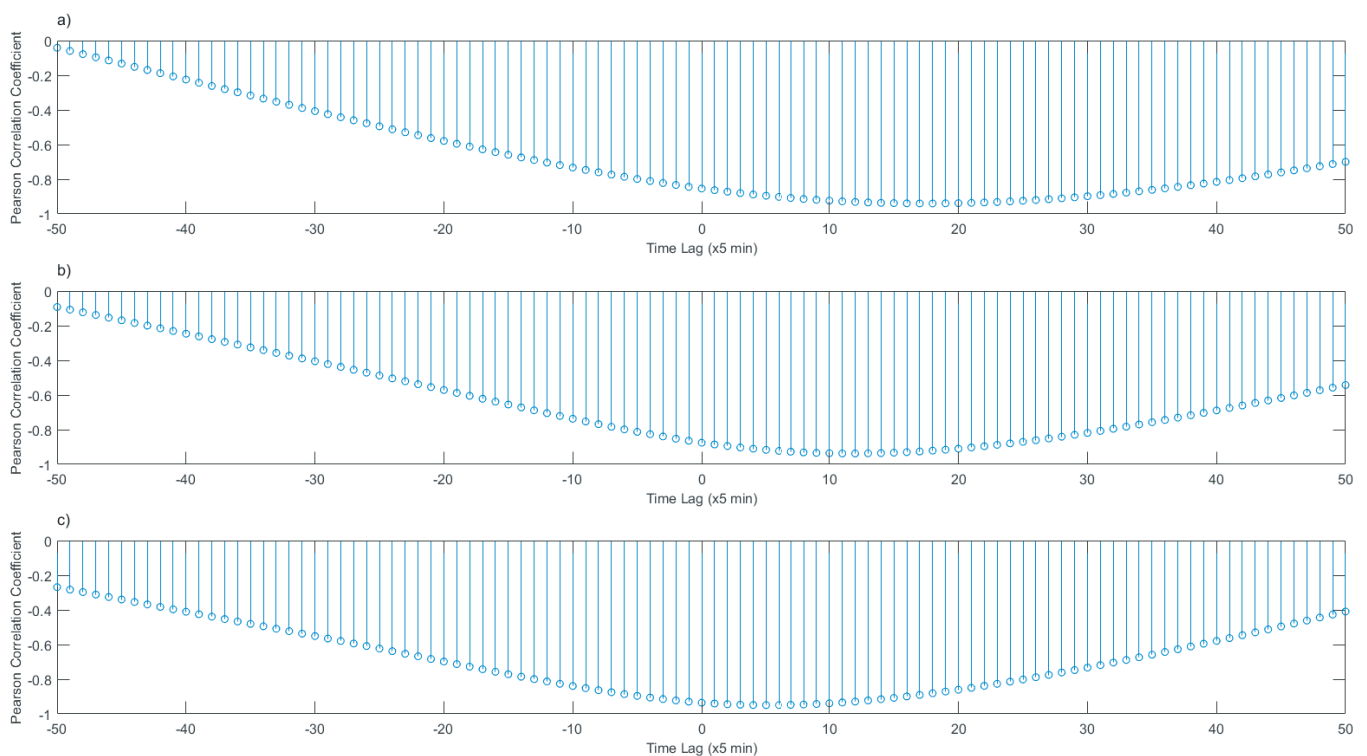
Supplementary Material

Figure S1: Cross-Correlation between periodic sap flow and trunk diameter variations. Time delay that maximizes the correlation between both variables is 17, 11, and 5 for the a) post-flowering, b) post-veraison, and c) mid-maturation to ripening phenological intervals, respectively.

Table S1: Solar radiation, mean temperature, and relative humidity registered at the experimental vineyard (Douro Demarcated Region), during the 2017 growing season.

	Post-Flowering			Post-Veraison			Mid-Maturation to Ripening		
	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.
Solar Radiation (W/m²)	0	304	1107	0	301	1037	0	229	996
Mean Temperature (°C)	12.66	23.73	36.56	14.26	28.52	43.11	12.99	25.68	40.05
Relative Humidity (%)	9.92	50.83	93.67	4.71	34.81	77.6	8.58	32.10	64.81

Table S2: Both-direction stepwise regression models of inter-daily trunk diameter variations and sap flow.

Trunk Diameter Variations

Phenological interval	Model	Adjusted R^2	P-Value
Post-Flowering	tdv = -0.25 + 0.14SR + 0.25Tg + 1.34RH	0.82	1.63e-96
Post-Veraison	tdv = -0.02 + 1.38RH	0.88	2.76e-76

Sap Flow

Phenological interval	Model	Adjusted R^2	P-Value
Post-Flowering	sf = 0.64 + 0.14SR − 0.19RH	0.25	2.78e-17
Post-Veraison	sf = 0.36 + 0.21Tg + 0.22RH	0.12	1.53e-05