

**CAMPANIA REGION GRAPEVINE PATRIMONY: A  
DETERMINATION OF THE HEAT REQUIREMENT OF 19 NEARLY  
ALL-NATIVE CULTIVARS. NINE YEARS OF OBSERVATIONS.**

**PATRIMOINE VITICOLE DE LA RÉGION CAMPANIA: UNE  
DÉTERMINATION DES EXIGENCES DE CHALEUR DE 19 VARIETES  
PRESQUE TOUTES INDIGÈNES. NEUF ANS D'OBSERVATIONS.**

G. SCAGLIONE\*; C. PASQUARELLA\*

*\*Dipartimento d'Arboricoltura, Botanica e Patologia Vegetale, Università degli Studi di Napoli, "Federico II".*

*Via Alessandro Scarlatti, 110, 80129 - Napoli. E - mail: [scaglione@unina.it](mailto:scaglione@unina.it)*

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**ABSTRACT**

There is little information on the grapevines cultivated in the Campania region (south of Italy). In particular insufficient are the studies on the thermal requirements of such grapevines. Trials on the thermal needs of the grapevines may contribute to the correct positioning of the cultivars in areas able to optimise the environment genotype ratio of a cultivar on which, qualitative expression of the production depends. For said motivations it has been set up the present study, in which it was determined the thermal requirements of 19 cultivars nearly all native of the Region, having like reference the model proposed by AMERINE and WINKLER (1944). The study that evidenced an heat requirement of the studied cultivars variable from 1625 degree-days (cv Fiano) to 2011 degree-days (Bianca Zita), adds an other step to the acquaintance of the Campania grapevine patrimony.

**RESUME**

Nous avons peu d'informations sur les cépages cultivés dans la région de la Campania (sud de l'Italie). En particulier insuffisant sont les études sur les besoins thermiques de tels cépages. Les études sur les besoins thermiques des cépages peuvent contribuer au positionnement correct des cultivars dans les zones capables d'optimiser le rapport génotype-environnement des cépages du quel dépend, l'expression qualitative de la production. Pour les dites motivations nous avons effectué la présente étude, dans laquelle nous avons déterminé les conditions thermiques de 19 cépages presque tous indigènes de la Région, ayant comme référence le modèle proposé par AMERINE et WINKLER (1944). L'étude qui a déterminé une exigence de la chaleur des variétés étudiées variables de 1625 degré-jours (cv Fiano) à 2011 degré-jours (Bianca Zita), ajoute une autre étape à la connaissance du patrimoine viticole de la Campania.

## INTRODUCTION

The Campania region grapevine patrimony is rich in accession and unfortunately unknown for the most part. Seventy-five accessions currently can be counted. Among these, an important role may be occupied by the cultivars tested in the present trial, on which actually we have at our disposal very few information on their heat requirement.

The studies on the thermal needs of the cultivars, and generally on environmental adaptation of the grapevines, are very important in order to evaluate the environmental influences on their production and quality.

These trials, through the estimation of the thermal need of a grapevine, may contribute in studies on viticultural zoning to a correct placing of a grapevine in a data environment, maximizing the qualitative expression of the grapevine.

The increasing need to optimise the quality of said cultivars has led our Department to set up, the present research, so as to estimate their thermal need in various environment.

## MATERIAL AND METHODS

Test was carried out in the nine-year period, 1992-1999, on a number of 10-30 plants per grapevine of the cultivars: Aglianico, Agostinella di Castelvenere, Bianco antico, Bianca zita, Catalanesca, Cerreto, Coda di cavallo, Coda di pecora, Coda di volpe, Falanghina, Fiano, Malvasia, Pepella, Ripolo, Piediroso, San Nicola, San Pietro, Sciascinoso, Trebbiano. The plants, of 7-15 year-old, all grafted onto Berlandieri x Riparia 420a, were grown in four environments of the three provinces of Benevento, Avellino, Salerno (Campania region, southern Italy; Figure 1) according the scheme reported (Table 1). The plants, arranged according to the rectangular plan of 2.50 x 1.20 m, were trellis trained and Guyot pruned, leaving with the winter pruning a bud-load of 10+2 (the first number denotes the number of buds left on the cane, the second indicates those left on the spur with winter pruning).

The phenological stages were monitored starting from the bud sprout to the ripening on an overall initial number, per cultivar, of 100-300 buds. In order to monitor the evolution of the development stages we used methods already adopted by other authors (Intrieri *et al.*, 1987; Intrieri *et al.*, 1988; SCAGLIONE, 1996; SCAGLIONE *et al.*, 1998 a, b, c, d; SCAGLIONE *et al.*, a, b), using appropriate phenological charts, based on a strictly sequential observation method. The phenological phase was considered fully reached when the 50% of the functional units, in the whole population of the plants in question, showed signs of the stage (IBPGR, 1983). From fruit-set to ripening in each year, 3-4 clusters from each grapevine/treatment were sampled at weekly intervals and used to determine the refractometric sugar content at harvest ( $^{\circ}$ Brix) of the must (data not reported). To determine the phase of maturation, reference was made to the refractometric dry residue, setting at 18-20  $^{\circ}$ Brix, (according to the considered grapevine) the reference for the phenological stage (INTRIERI *et al.*, 1988, l.c.). The heat requirement of each grapevine was calculated having as reference the model proposed by AMERINE and WINKLER (1944) expriming the thermal needs of a data cultivar as "thermal units" or "degree-days (DD)".

## RESULTS

The maturation (Stage M), was fully reached between 251<sup>th</sup> (Falanghina, Pontecagnano) to 284<sup>th</sup> (Piediroso, Lapio), (Table 1).

The heat requirements of the tested grapevines ranged between 1625 degree-days (Fiano, Lapio) to 2011 (Biancaziata, Pontecagnano).

In particular, a group of four cultivars showed a very low thermal need, lesser than 1700 degree-days (also indicated as DD): Fiano had the lowest heat requirement (1625 DD), Sciascinoso and Trebbiano Toscano had a quite similar thermal need of 1650, while Piedirosso showed an exigency of 1700.

Another group of four grapevines with a thermal needs among 1701 to 1800 DD included: Falanghina (1736 degree-days DD), Cerreto (1790), Bianco antico (1794), Agostinella (1798).

The heat requirement of a third group of cultivars ranged between 1801 to 1900 DD: in particular Aglianico showed a thermal need of 1804 DD; Ripolo of 1829, Catalanesca of 1865, Malvasia di Candia of 1880 and San Pietro of 1896.

Finally, a group of grapevines showed an high thermal need ranging between 1901 to 2000 degree-days: this group included Coda di Cavallo with an exigency of 1903 DD; Pepella (1916 DD), Coda di Pecora (1946), San Nicola (1952).

As stated above, Biancaziata showed the highest heat requirement (2011 DD).

## CONCLUSION

The present study adds another step to the information about the Campania region grapevine patrimony.

The AMERINE-WINKLER model responded very well in our Region, in order to estimate the thermal needs of the tested cultivars: during the nine years of the trial, in fact, we never observed environmental limiting factors the use of the model.

The research may contribute to a correct positioning of the tested cultivars in different environments of the Campania (viticultural zoning) in order to maximize the qualitative expression of the tested genotypes.

The wide range of thermal needs of the tested grapevines, nearly all autochthon of the Campania, permit to ipotize a potential large placement in many different territories of the Region in order to increase its offer of wines.

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FIGURE 1 – MAP OF THE SITES: AV, BN, SA, INDICATE RESPECTIVELY THE PROVINCE OF AVELLINO, BENEVENTO AND OF SALERNO.

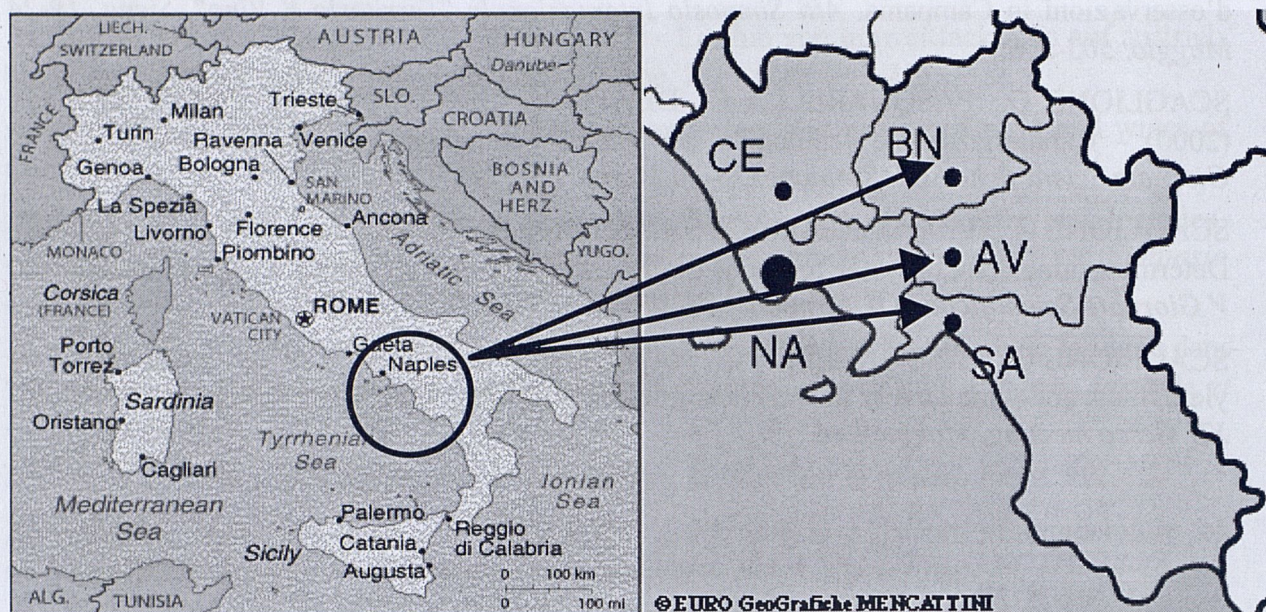


Table 1 – Thermal needs of the tested grapevines (period '92-2000).

Grapevines	Place of observations	Years of observations	Maturation Julian day	Sugar (°Brix)	Thermal units (degree-days)
Aglianico (b)*	Lapio (AV); Monte Taburno (Bn)	'93,'94,'95,'96	278	18	1804
Agostinella di C. (w)*	Pontecagnano (Sa)**	'97,'98,'99	244	20	1798
Bianco antico (w)	Pontecagnano (Sa)	'98,'99,2000	244	20	1794
Biancazita (w)	Pontecagnano (Sa)	'98,'99,2000	250	18	2011
Catalanesca (w)	Pontecagnano (Sa)	'98,'99,2000	244	18	1865
Cerreto (w)	Pontecagnano (Sa)	'98,'99,2000	244	20	1790
Coda di cavallo (w)	Pontecagnano (Sa)	'98,'99,2000	269	20	1903
Coda di pecora (w)	Pontecagnano (Sa)	'98,'99,2000	252	18	1946
Falaghina (w)	Pontecagnano (Sa)	'98,'99,2000	251	20	1736
Fiano (w)	Lapio (Av)	'93,'94,'95,'96	258	18	1625
Malvasia di C. (w)	Castelvenere (Bn)**	'92,'93	281	21	1880
Pepella (w)	Pontecagnano (Sa)	'98,'99,2000	257	19	1916
Piedirosso (b)	Lapio (Av)**	'93,'94,'95,'96	284	20	1700
Ripolo (w)	Pontecagnano (Sa)	'98,'99,2000	244	19	1829
S. Nicola (w)	Pontecagnano (Sa)	'98,'99,2000	254	18	1952
S. Pietro (w)	Pontecagnano (Sa)	'98,'99,2000	254	20	1896
Sciascinoso (b)	Lapio (Av)	'93,'94,'95,'96	271	20	1650
Trebbiano Tosc. (w)	Castelvenere (Bn)	'92,'93	281	18	1650

\* (b) and (w) indicate respectively: black and white berries grapevines.

\*\* (Av), (Bn), (Sa), indicate respectively the province of Avellino, Benevento and of Salerno.