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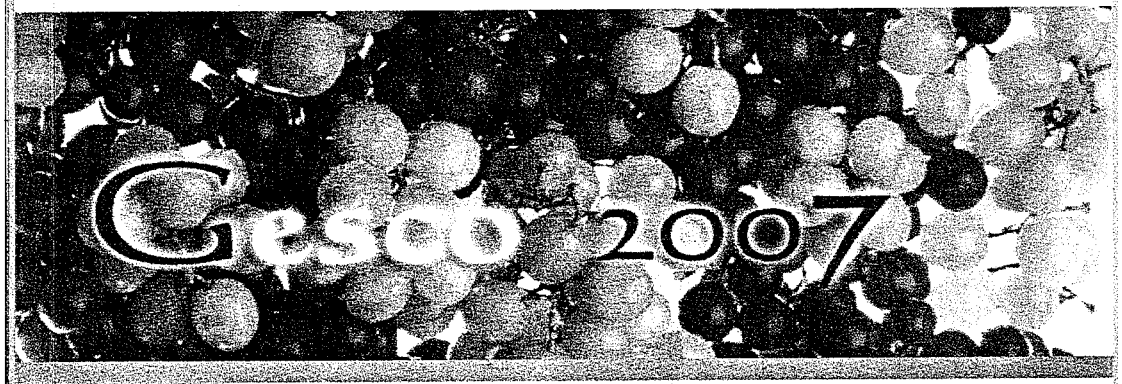

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THE INFLUENCE OF PINCHING ON SOME TECHONOLOGICAL CHARACTERISTICS OF CLUSTER AND BERRY OF ITALIA GRAPE VARIETY

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Abstract

The aim of investigation was to confirm the influence of pinching on some technological characteristics of *Italia* grape variety: dimension and shape of cluster and berry, mechanical characteristics of berry, and chemical content of must (sugar and total acids).

Pinching was applied in two terms (before and after blooming) with two ways: by cutting 1/2 and 1/3 of bunch (P1, P2, P3, P4) and control (K).

From the results we can concluded that the time and the way of pinching has the influence on technological characteristics.

The pinching 1/3 before and after blooming increased the weight of cluster and berry and increased the transportability.

Key words: variety, pinching, cluster, berry

1996/98	**416.11**	**16.36**	**10.73**	**1.52**	**92.01**	**6.16**
CV%	10.17			14.58	5.95	
Index	109				105	58

With the greatest weight of cluster (429.37 g) is the variant P3 (1/3 before blooming) and is 13% greater than control (381.05 g) and in the same time with greatest number of fecundated berries (93.60) which is 7% more than control (87.54). The pinching changed the shape of cluster. The variant control has the conical shape of cluster and the variants P1 (1/2 before blooming) and P2 (1/2 after blooming) has the oval shape of cluster, at the variants P3 and P4 the pinching decreased the cluster length and the basic (conical) shape is keep. With the best characteristics of cluster is the variant P3 (1/3 before blooming). This variant has the large and nice cluster, with medium density, conical shape and equal size of berries.

The results of influence of pinching on the dimensions and shape of berry are present in the table 2.

Table 2: The influence of pinching on the dimensions and shape of berry

Variant	Year	Weigh g	Length mm	Width mm	L/W	Average dimensions
C control	1996	5.10	21.20	18.24	1.16	19.72
	1997	5.23	19.67	16.26	1.21	17.97
	1998	4.56	19.53	17.75	1.10	18.64
	1996/98	**4.96**	**20.13**	**17.42**	**1.16**	**18.78**
	CV%	7.16			4.76	4.70
	Index	100				100
P1	1996	5.49	23.01	19.26	1.19	21.13
	1997	5.65	20.77	17.11	1.21	18.94
	1998	5.80	20.30	17.80	1.14	19.05
	1996/98	**5.64**	**21.36**	**18.06**	**1.18**	**19.71**
	CV%	2.75			3.06	6.26
	Index	114				103
P2	1996	5.40	20.68	18.36	1.13	19.52
	1997	5.25	19.35	16.74	1.15	18.04
	1998	5.11	17.03	16.21	1.05	16.62
	1996/98	**5.25**	**19.02**	**17.10**	**1.11**	**18.06**
	CV%	2.76			4.77	8.03
	Index	106				96
P3	1996	5.54	19.60	17.52	1.12	18.56
	1997	5.82	19.48	16.97	1.15	18.23
	1998	5.41	19.24	17.68	1.09	18.64
	1996/98	**5.59**	**19.44**	**17.36**	**1.12**	**18.48**
	CV%	3.75			2.68	0.93
	Index	113				98
P4	1996	5.97	22.52	19.73	1.14	21.12
	1997	5.92	20.30	17.68	1.15	18.99
	1998	5.23	19.52	17.57	1.11	18.55
	1996/98	**5.71**	**20.78**	**18.32**	**1.13**	**19.55**
	CV%	7.25			1.84	7.03

With the greatest strength of pressing (1985 g) is the variant P3 (before blooming) and is 13% greater than control (1755 g). With the smallest (1987 g) is the variant P4 (1/2 after blooming) and is 12% smaller than control. Between the years of investigation at the all variants this element has a small variation which means that the growing conditions haven't significant influence. From the results only the pinching of cluster before blooming increased the breaking off resistance of berry. With the greatest breaking of resistance (471 g) are the berries from the variant P4 and is 14% greater than control (412 g) and with the smallest (468 g) are the berries from the variant P3 (1/2 before blooming).

The results of influence of pinching on the content of sugar and total acids in the must are present in the table 4.

Table 4 The influence of pinching on the content of sugar and total acids in the must

Variant	Year	Sugar g / dm^3	Total acids g / dm^3
C control	1996	153	6.4
	1997	177	6.7
	1998	162	4.6
	1996/98	**164**	**5.9**
	CV%	7.30	19.25
	Index	100	100
P1	1996	148	6.0
	1997	192	6.9
	1998	159	4.3
	1996/98	**166**	**5.7**
	CV%	13.77	23.03
	Index	101	97
P2	1996	157	5.1
	1997	191	7.6
	1998	151	4.3
	1996/98	**166**	**5.7**
	CV%	12.97	30.38
	Index	101	97
P3	1996	167	5.6
	1997	171	6.7
	1998	161	4.4
	1996/98	**166**	**5.6**
	CV%	3.03	20.67
	Index	101	95
P4	1996	169	4.7
	1997	169	7.1
	1998	158	4.2
	1996/98	**166**	**5.3**
	CV%	3.84	29.07
	Index	101	90

INVESTIGATIONS OF ANATOMICAL CHARACTERISTICS OF SOME WINE AND TABLE - GRAPEVINE CULTIVARS, IN SKOPJE AREA OF VINEYARDS

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Abstract

Comparative researches of anatomical characteristics on the plant (grapevine cultivars *Vitis Vinifera*) are important for disposition in the area around oneself (training system).

Anatomical and physiological characteristics are genetic determinate and they indicate of the genotypical variability.

In this paper are presented results from investigations of some anatomical and physiological characteristics on mature branches of some cultivars (dattier, muscat hamburg, vranec, merlot, žilavka and riezling). Anatomical characteristics are the internode length, anatomical construction of buds, a diameter etc., and they are features of cultivars.

The researches were conducted during the period 2002 - 2005 in the grapevine plantations of the Institute of Agriculture, Skopje. The mature branches, in two variants were measured - from 1 to 8 bud, and from 1 to 10 bud. The internodes, from 4 to 10 bud, separately were measured. The anatomical construction of buds and diameter were observed with diagonal and longitudinal cuts. They were photographed, separately.

For analysis, mean value from 30 representative samples was taken. For comparison of the analysed characteristics at investigated cultivars, the official O.I.V. botanical classification (description) was used.

The obtained results of the analysed parameters are of a great importance for physiological condition of plant, appropriation of training system, trunk number per unit of surface, planting distance, fertility of buds and so on.

Key words: internode, length, diameter, bud, diagonal and longitudinal cuts, description

1. Introduction

The internodes length, diameter of the internodes and anatomical construction of buds from the grapevine are anatomical characteristics and they are a significant characteristics and genetic yield potential of the various grapevine cultivars. These characteristics are in O.I.V. system and they are applied in the ampelographic description of the cultivars, that is afterwards applied for easier identification of the cultivars, for characterization of the cultivars properties, for protection of the copyrights of one cultivar, for the genetic resources and the gene-bank. The knowledge of these cultivar characteristics is significant for determination of the way of cultivation, for planning of the number of grapevine planting, the planting distance etc. The familiarity of these characteristics can also give you information regarding the thickness, growth, fecundity and productivity of the grapevine, and it can help you to regulate the mentioned characteristics.

The ecology conditions in the certain years, and the applied scientific farming methods can have some impact on the internodes and mature branches length. But that impact is insignificant and yet these characteristics are considered as a cultivar characteristis according which the cultivars differ from each other.

3. Results and discussion

In our researches were conducted some wine and table grapevine cultivars (dattier, muscat hamburg, vranec, merlot, žilavka and riezling). The cultivar dattier belong to the group (convarietas) Orientalis, subgroup (subconvarietas) Antasiatica, muscat hamburg belong to Pontica Georgica, cultivars vranec and žilavka belong to Pontica Balcanica and cultivars merlot and riezling to the group Occidentalis Gallica.

The results of the research are shown in tables 1 - 6.

The tables show that on the average the cultivar dattier is characterized with longest internodes i.e. 108,5 mm, and on the average the shortest internodes are characteristic for the cultivar žilavka i.e. 85,7 mm. The coefficient of variation (CV%) is highest for the cultivar riezling i.e. 16,16.

The average diameter of the internodes is the biggest at the cultivar žilavka i.e. 8,8 mm, and it is the smallest at cultivar riezling i.e. 7,2 mm. The coefficient of variation (CV%) is the highest at the cultivar riezling i.e. 18,67.

The anatomical construction of buds was observed with diagonal and longitudinal cuts. Buds were compared and were photographed, separately.

Anatomical characteristics are features of cultivars and specific characteristics of ecology and geographical classification (group).

On figures 1 and 2 anatomical construction of bud and diameter of one cultivar, are shown.

Table 1: Dattier

Year	The internodes length from 4 to 10 bud (mm)	The internodes diameter (mm)
2002	98,9	7,5
2003	107,4	8,7
2004	125,1	9,0
2005	102,5	8,1
2002/2005	**108,5**	**8,3**
CV%	**10,71**	**7,99**

Table 2: Muscat hamburg

Year	The internodes length from 4 to 10 bud (mm)	The internodes diameter (mm)
2002	97,6	7,6
2003	103,4	8,2
2004	107,0	9,1
2005	99,8	8,0
2002/2005	**102,0**	**8,2**
CV%	**4,05**	**7,71**

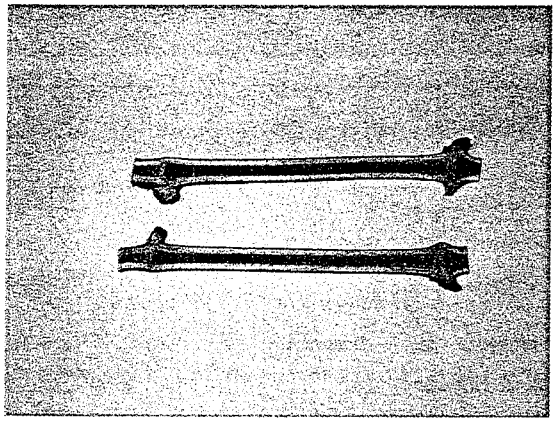

Fig. 1 longitudinal cuts of internodes and buds

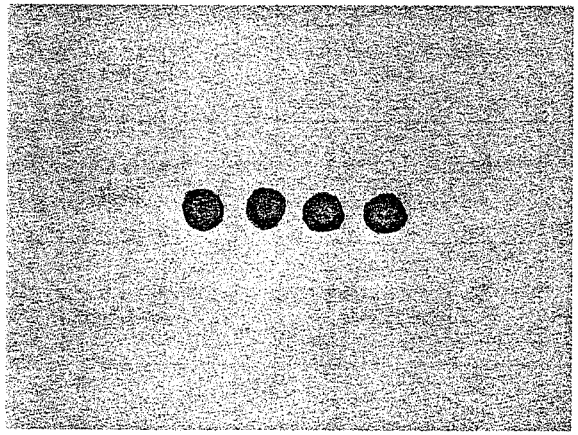

Fig. 2 Diagonal cut of the internode

4. Conclusions

According to the researches and the ampelographic description pursuant to the O.I.V. system, the following conclusions can be drawn:

1. According to the obtained results, on the average the cultivar dattier hat the longest internodes i.e. 108,5 mm, and the cultivar žilavka has the shortest internodes i.e. 85,7 mm.

2. The diameter of the internodes is the biggest at the cultivar žilavka 8,8 mm and the smallest at the cultivar riezling and chardonnay 7,5 mm.

3. The considerably high CV% points to the fact that those cultivars have great variations of the length of the internodes and the diameter and regarding to some dimensions the cultivars are very close to one another.

4. According to the O.I.V. valuation, the cultivars dattier, muscat hamburg, merlot and riezling have to middle internodes, the cultivars vranec and žilavka have a little bit closer to short internodes. According to the O.I.V. valuation, the cultivars dattier, muscat hamburg, merlot and riezling have a small to middle diameter, the cultivars vranec and žilavka have a middle diameter of the internodes.

5. The cultivar žilavka is characterized by the shortest internodes and the biggest diameter of the internodes.

6. Anatomical construction of buds is normal without any irregularities.

7. Significant for these characteristics is that they are a part of the indexes according to which instructions can be given for the way of cultivation, the planning for the planting distance, planning ragarding the fecundity and the harvest of the cultivars etc.

PHYLLOMETRIC STUDY OF SOME WINE GRAPEVINE CULTIVAR (*VITIS VINIFERA* L.) FROM THE BALKAN SUBGROUP (*SUBCONVARIETAS BALCANICA* NEGR.)

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Abstract

The aim of investigations was to establish the basic leaf characteristics of grapevine cultivars of balkan subgroup, with the phyllometric researches. Ten cultivars for red wine production (*Blatina, Vranec, Kratoshija, Teran, Kadarka, Prokupec, Stanushina, Melnik, Mavrud* and *Plovdina*) and four cultivars for white wine production (*Zilavka, Sipon, Zupljanka* and *Smederevka*) were studied.

The established standards has the practical meaning in the description and differentiation of eventual biotypes and clones in the population of this cultivars trought the clonal selection.

On the base of obtained results from the cluster analysis of phyllometric parametars the classification of 14 investigated cultivars was done. According to the values closeness of phyllometric characteristics the cultivars are classified in clusters from wich can determine the differences or similarities between the examinated cultivars.

Two cluster analysis are made. For the classification of cultivars in the first cluster analyse we used 19 phyllometric descriptors from the GENRES List of primary descriptors, part II. For the second cluster analyse the parametars from the "leaf method" are used.

According to the phyllometric characteristics in the both cluster analysis very closeness linkage has the cultivars mavrud and plovdina, and kratosija and vranec. This means that there lot of common leaf characteristics between these cultivars.

Key words: phyllometry, balkan subgroup, cluster analysis

Introduction

The correct differentiation and identification of grapevine varieties is very important for Vitis germplasm maintaining institutions, legislation and for wine industry. At the moment three different methods are employed for this purpose: morphological description, application of isoenzyme and microsatellite markers. Methods related of traditional ampelography are based on the description of vine different organs, often using biometry combine with the visual observation. Identification of grapevine variety using a leaf parameters are some of the most important targets of ampelometry. According to this, the leaf measurements has the high discrimanting power. The present paper will focus on the application of leaf descriptors.

Materials And Methods

14 cultivars were described. All belongs to the *convarietas Pontica* Negr., *subconvarietas balcanica*, from wich 10 are red cvs. (*Blatina, Vranec, Kratoshija, Teran, Prokupec, Kadarka, Stanushina, Melnik, Mavrud* and *Plovdina*) and 4 are white cvs. (*Sipon, Zilavka, Zupljanka* and *Smederevka*). Some of this cultivars are autochthonous and have been cultivated since long ago in the Macedonian vineyards (*Stanushina*) while others have been introduced to our vineyards after the phylloxera chrisis (*Prokupec, Teran,*). The varieties are located in Skopje and Tikvesh vineyard area. Mature leaves are collected in August, during three years (2002, 2003 and 2004), at least one leaf was taken between the 8th and 12th node of main shoot. We used 19 phyllometric descriptors from the GENRES List of primary descriptors, part II (601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 612, 613, 614, 615, 616, 617, 066-4, 066-5, 079-1) and the parameters from the "leaf method" (Costacurta, 1996): length of vein N1; distance between petiol sinus and lower sinus; distance of N3 / distance of N1; length of peduncle / length of N1; lenght of N2 / length of N1; length of N3 / length of

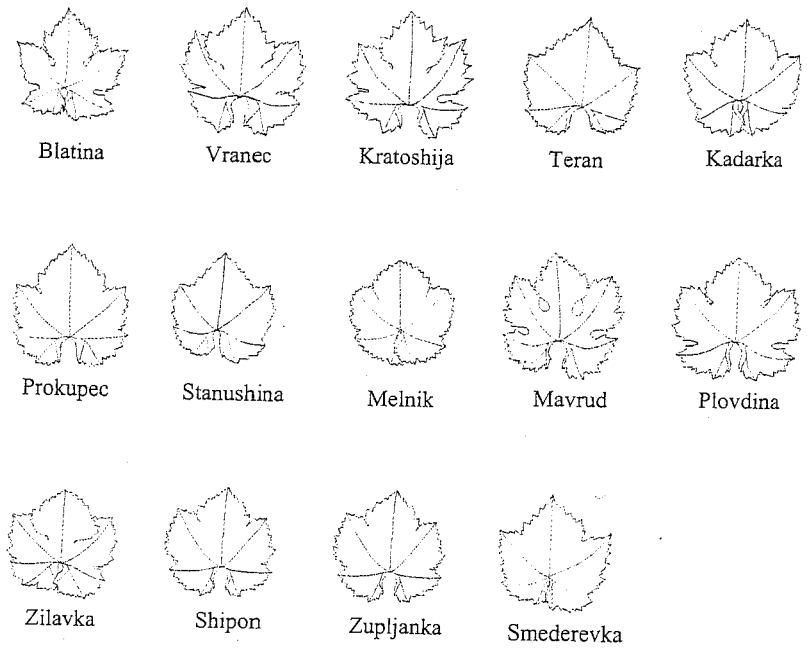

Fig. 3: Graphic reconstruction of an average leaf of each cultivar

Conclusions

From the obtained results we made following conclusions:

- The established basic leaf characteristics of grapevine cultivars of balcan subgroup has the practical meaning in the description and differentation of eventual biotypes and clones in the population of this cultivars trough the clonal selection

- According to the closeness of phyllometric characteristics the cultivars are classified in clusters from which can determine the differences or similarities between examinated cultivars

- From the all cultivars studied the cvs. *Mavrud* and *Plovdina,* and *Kratosija* and *Vranec* showed the smallest phyllometric distance between each other. This means that there lot of common leaf characteristics between these cultivars.

- Correct grouping between cultivars confirm the high discriminant power of used phyllometric parameters

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THE EFFECT OF PRUNING AND CLUSTER THINNING FOR PRODUCING OF DESSERT WINE'S RAW MATERIAL FROM SEMILLON CULTIVAR IN SKOPJE WINE DISTRICT'S CONDITIONS

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Keywords: Semillon, dessert wine' raw material, pruning, thinning, yield, sugar.

Abstract

Possibilities of producing dessert wine's raw material from Semillon cultivar has been researched in the Skopje vineyard district climate condition. The following treatments were applied: pruning (16, 20 and 24 buds/vine) and thinning of the cluster (without thinning, 1 cluster/shoot and 1 cluster/2 shoot). In two moments of ripening (full ripe and 20 days after full ripe stage) the yield and content of sugar in must has been researched.

The yield and content of sugar in must statistically differ. Depending of the treatment raw material for different types of dessert wine has been obtained 185-233 g/dm^3 sugar in full ripe and 227-271 g/dm^3 after full ripe stage. Value of content of sugar is obtained from must of all grapes from one vine. Highest value of content of sugar is possible to obtain with picking of raisin grape.

Introduction

There is a possibility of production of dessert wine raw material in southern parts of Europe, in the Mediterranean countries, as well as in the northernmost vine regions of Europe, in the Rheine river valley in Germany and in Hungary. The dessert wines are the result of the tradition, climate conditions, cultivars, ampelotechnical measures applied, and specific grape and vine production technology. In this work, the influence of the ampelotechnical measures, number of buds, and cluster thinning on the quality of dessert wine raw materials is researched.

In the Reynolds's experiment (Reynolds A.G., 2001) about the influence of the minimal pruning on the chemical composition of the must, where vines were subjected to three pruning treatments: manually pruned, hedged, and minimally pruned. Yields of hedged and minimally pruned vines were higher than manually pruned vines, but cluster weights, berries per cluster, and berry weights were lower. Minimal pruning resulted in fruit with lowest sugar, titratable acidity, and anthocyanin concentration. This experiment indicates the necessity of ampelotechnical measures of pruning and thinning. The influence of pest and disease control is also important.

Leguay M. 1983, notices linear progress of yield in pinot noir cultivar when vines were subjected to thinning in 6, 8, 10, and 12 buds, but at also linear decrease of soluble solids concentration. Cluster thinning – 10, 8, or 6 clusters per vine, decreased yield for 34%, but also improved the grape quality. The authors emphasize that thinning of the grapes is uncertain ampelotechnical measure, which depends on many factors.

Thinning of the grapes, as a measure of the green pruning, consists of elimination of clusters or parts of a cluster. According to Winkler A.K., (1976), there are far more possibilities available for improvement of the grape quality compared to the winter pruning. This ampelotechnical measure is used manly with the table grape cultivars resulting in better yield and vegetative growth of the vine and, also, in unification of the grapes in their size, color, and acids and sugar content.

Wunderer W., (1990) studying the influence of cluster thinning, with the proportion of cluster thinning changed from 16 to 54%, concludes that the cluster thinning results in a reduction of yield, increased vegetative growth, higher cane weight and bud fruitfulness and higher wine quality.

variants with thinning of clusters – one cluster per two shoots (V – 0.5), showed increase in the yield with the increase of the number of buds with pruning

Table - 1 Influence of the treatments – pruning and thinning of clusters upon the yield in two moments of harvest

Treatments and variants	Full ripeness	20 days after full ripeness
16 buds/vine-St	11.8	9.7
16 buds/vine - 1.0	8.1	6.8
16 buds/vine - 0.5	5.7	4.8
20 buds/vine - St	**13.8**	**10.6**
20 buds/vine - 1.0	**10.6**	**8.8**
20 buds/vine - 0.5	**6.3**	**5.4**
24 buds/vine - St	12.5	10.0
24 buds/vine - 1.0	10.0	8.2
24 buds/vine - 0.5	7.9	6.6

The yield varies within the groups with 16, 20, and 24 buds per vine with thinning of the clusters. The yield decreased from 11.8 t/ha to 5.7 t/ha (variant 16 buds), from 13.8 t/ha to 6.3 t/ha (variant 20 buds), and from 12.5 t/ha to 7.9 t/ha (variant 24 buds/vine)

Table - 2 Influence of treatments – pruning and thinning of clusters upon the sugar content in the must at three points of harvesting

Treatments and variants	Full ripeness	20 days after full ripeness
16 buds/vine-St	193	227
16 buds/vine - 1.0	211	251
16 buds/vine - 0.5	231	271
20 buds/vine - St	**185**	**232**
20 buds/vine - 1.0	**214**	**253**
20 buds/vine - 0.5	**233**	**269**
24 buds/vine - St	190	232
24 buds/vine - 1.0	208	252
24 buds/vine - 0.5	226	268

At all points of ripeness, the sugar content in the must is standardized between the variants of 16, 20, and 24 buds at the same level of thinning, the statistical procedure has not indicated significant difference. The sugar content in the must strongly varies within the group with 16, 20 and 24 buds per vine, where thinning of the clusters has been employed.

At the moment of full ripeness, the content of sugar increases from 193 g/dm^3 to 231 g/dm^3 (variant 16 buds/vine), from 185 g/dm^3 to 233 g/dm^3 (variant 20 buds/vine), and from 190 g/dm^3 to 226 g/dm^3 (variant 24 buds/vine).

Twenty days after the full ripeness, the sugar content in the must increases from 227 g/dm^3 to 271 g/dm^3 (variant 16 buds/vine), from 232 g/dm^3 to 269 g/dm^3 (variant 20 buds/vine), and from 232 g/dm^3 to 268 g/dm^3 (variant 24 buds/vine).

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THE INFLUENCE OF PINCHING ON SOME TECHONOLOGICAL CHARACTERISTICS OF CLUSTER AND BERRY OF ITALIA GRAPE VARIETY

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Abstract

The aim of investigation was to confirm the influence of pinching on some technological characteristics of *Italia* grape variety: dimension and shape of cluster and berry, mechanical characteristics of berry, and chemical content of must (sugar and total acids).

Pinching was applied in two terms (before and after blooming) with two ways: by cutting 1/2 and 1/3 of bunch (P1, P2, P3, P4) and control (K).

From the results we can concluded that the time and the way of pinching has the influence on technological characteristics.

The pinching 1/3 before and after blooming increased the weight of cluster and berry and increased the transportability.

Key words: variety, pinching, cluster, berry