IMPROVING TECHNOLOGY FOR PRODUCTION TABLE GRAPES AT ŞTEFĂNEŞTI-ARGES VINEYARD

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Abstract
Climatic conditions in recent years, table grapes grown in INCDBH Ştefăneşti-Arges have suffered greatly. Thus, after the winter of 2011-201, were most affected, after frosts in February 2012 (-20.9 ° C). To avoid loss of production must improve technology applied in plots with table grape varieties. In this paper, these improvements were the differentiated application logging, leading to increased production quantity and quality of table grapes. Varieties taken in the experiment were: Argessis, Golden Ştefăneşti, Augusta, Muscat Hamburg, Victoria and seedless varieties: Canner, Perlette and Otilia. Depending on the type of cut applied to these species, it was observed that cutting short rod elements (drill and cord) is increasingly recommended, followed by cutting long string of 10-12 eyes. All types of cut applied, do not increase the production of grapes / ha, if those varieties are not grown on land fertilized properly and are not applied in time the technology works agrophytotechnical initially set.

Keywords: table grapes, technology, seedless varieties, production,

1. INTRODUCTION

Study technological potential of new varieties of table grapes, allowed exposure of quantitative and qualitative characteristics superior resistance to frost, drought and pathogens to current varieties grown in the vineyard. The experimental group located in the complex wine representative of Muntenia (Arges Ştefăneşti) have made observations and measurements on the quality of table grapes in the climatic conditions of the area Arges. Plantation of grape-vine is distant 2.2 / 1 m, type Guyot pruning is applied on stem. Cuts applied to these varieties were differentiated, so I cut the drill 2-3 eyes, the heart strings 4-6 and 10-12 eyes sight.

2. MATERIAL AND METHOD

Table grapes were harvested when their level of maturity provides superior and efficient recovery. This was determined according to the variety in general, when the grapes have reached full maturity. Moment of full maturity varieties of table grapes was established with a good approximation, by performing the following measurements: weight grain wort sugars content and titratable acidity. These measurements were performed at intervals of 3-5 days from the entry grapes ripening.
Brief description of the varieties included in the study:
ARGESSIS - sort SCDVV Ştefăneşti approved in 2002. The first kind of vine grapes obtained in specific climatic conditions vineyard Ştefăneşti-Arges. Commercial Aspect pleasant large grain (7.5 to 8.0 g), ovoid, bluish-black color. Sea grape (450-480 g), uniaxial. Good tolerance to fungal diseases (blight, mildew, rot). Hub of great force, suitable for crop canopy. Media production to 15 t / ha.
GOLDEN ŞTEFĂNEŞTI - first variety of white grape vine table with baking early obtained under specific climatic vineyard Ştefăneşti-Arges, approved in 2007 INCDBH Ştefăneşti. Commercial Aspect pleasant large grain (5.5 to 6.8 g), spherical, yellow-gold. Sea grape (400-450 g), wing. Good tolerance to fungal diseases (blight, mildew, rot). Ripening grapes in the first period (28.07-05.08). Suitable for organic crops. Expanding the variety in culture provides an average production of 14 t / ha.

AUGUSTA - was obtained by sexual hybridization controlled Vine varieties Italia x Regina at the Agronomic Institute Bucharest. Approval variety was made in 1984. Required by the earliness (epoch II), size and look to the grapes. Augusta has a medium vigor, good fertility (61% of fertile shoots) and high productivity due to the size of grapes.
MUSCAT ADDA - grapes are medium-sized, conical, sometimes winged, dispersed, with average weight of 300 g beans are medium-sized or large, oval shaped, black and covered with a layer of pruina (wax). The core is meat, incense taste, thin skin, dark blue with muscat aroma has 2-3 seeds. The vine has a vigorous growth, capable of giving a high yield from cutting short the shoots. It is a variety with late ripening period. From open buds until full ripening of their past 145-155 days, and total active temperature is 2700-2800 ° C.
Experience has been the bi-factorial, with two factors:
-Factor A with graduations (varieties under study) a_1, a_2, a_3, a_4
-Factor B with graduations (such as cutting) b_1, b_2, b_3, with loads of fruit for 10, 15 and 20 eyes per vine. Following placement resulted in 12 variants the experimental study.

3. RESULTS AND DISCUSSION

The temperatures recorded at the weather station INCDBH Ştefăneşti fall within these limits, it contributes to the thermal microclimate specific phenological phases and the relief of the vineyard.

Table 1. Monthly average temperatures in the period 2010-2012 recorded at station I.N.C.D.B.H. Ştefăneşti (º C)

YEAR	MONTHS OF THE YEAR												ANNUAL AVERAGE
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2010	-2,0	1,4	5,3	11,5	15,9	19,9	22,1	23,5	16,7	8,4	9,7	0,2	11.0
2011	-0,8	-0,7	4,8	10,8	15,7	19,8	21,9	21,4	19,9	9,7	3,0	2,4	10,7
2012	-1,5	-4,4	6,1	13,1	16,5	21,5	25,5	23,7	19,2	8,9	3,4	0,5	11,0

Average annual rainfall in the vineyard Ştefăneşti-Arges 718 mm wide and 617 mm in the west to the east. Between April-September rainfall totals 439 mm and 343 mm.

Table 2. Monthly rainfall amount in the period 2010-2012 recorded at station I.N.C.D.B.H. Ştefăneşti (mm)

YEAR	MONTHS OF THE YEAR												ANNUAL AVERAGE
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2010	28,4	18,2	38,5	32,5	40,12	68,1	60,8	78,5	50,1	35,6	15,2	20,4	486,4
2011	26,4	16,2	54,5	34,6	78,9	93,3	82,4	23,4	0,2	34,3	-	31,3	475,5
2012	72,2	56,8	0,1	59,2	101,7	31,1	27,4	47,8	39,2	29,3	23,1	71,1	805,5

The average sunshine showed significant deviations only in the winter months, which does not affect physiological processes, grape vines during the vegetative rest. The average sunshine in the period studied was 2177,3 hours / year which are sufficient for physiological processes vine vines. The longest duration of sunshine in the period in 2010 was 2595,6 hours. Productivity variety of vineyard leaf area Ştefăneşti fall generally within their specific physiological (eg, 1 to 2.2 m^3/kg grape varieties Cabernet Sauvignon, Fetească regala and Tămâioasă romaneasca).

Table 3. Duration of sunshine in the period 2010-2012 recorded at station I.N.C.D.B.H. Ştefăneşti (hours)

YEAR	MONTHS OF THE YEAR												ANNUAL AVERAGE
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2010	161,3	100,5	197,5	287,2	264,9	319,4	397,0	268,0	228,8	140,8	129,4	100,8	2595,6
2011	161,2	100,5	197,5	180,0	252,7	291,7	267,9	250,1	197,1	189,7	126,1	132,1	2346,6
2012	146,1	81,8	206,3	185,9	252,5	238,8	225,9	252,5	199,4	189,6	158,2	100,5	2237,5

The average duration of sunshine totals in the vineyard Ştefăneşti approx. 2177 hours / year, falling within the recommended minimum values complex wine, the production lines. Weight in grams of grapes is shown in the chart below, so most weight was recorded Argessis variety, cut into strings of 10-12 eyes.

Table 4. Date of harvesting grapes at INCDBH Ştefăneşti-Arges (2010-2012)

NO	VARIETY	YEAR		
		2010	**2011**	**2012**
1.	Argessis	21.09	19.09	15.09
2.	Auriu de Ştefăneşti	27.08	27.08	20.08
3.	Augusta	29.08	20.08	18.08
4.	Muscat Adda	30.09	29.09	24.09

In Table 5 is shown the average calculated per unit area, so we can see that the highest yield recorded in variety Argessis at V_2 (19 000 kg / ha), due to cuts in rings 4-6 rod eye, which demonstrates that the variety performs very well in a medium fruit load (20 buds / vine), followed by production of the small difference in variety Augusta all the variant V_2 with a production of 19 320 kg / ha. The other varieties were recorded production between 13 680 kg / ha (Muscat Adda-V_3) and 18 440 kg / ha (Augusta-V_1). Recorded yields are close to those of the vineyard Ştefăneşti-Arges, recorded in other years.

Table 5. Total Production kg / ha calculated (gross)

VARIETY	VERSION	kg/ha
		Average 2010-2012
Argessis	V_1-10 eye/hub.	16 960
	V_2-15 eye/hub.	19 000
	V_3-20 eye/hub.	17 200
Auriu de Ştefăneşti	V_1-10 eye/hub.	17 400
	V_2-15 eye/hub.	17 560
	V_3-20 eye/hub.	14 880
Augusta	V_1-10 eye/hub.	18 440
	V_2-15 eye/hub.	19 320
	V_3-20 eye/hub.	16 000
Muscat Adda	V_1-10 eye/hub.	13 680
	V_2-15 eye/hub.	14 600
	V_3-20 eye/hub.	15 320

Mean productivity indices presented in Table 6 highlights the differences between the varieties studied, and between the experimental variants.

Table 6. Productivity Table grape varieties studied Vineyard Ştefăneşti-Arges (average, 2010-2012)

VARIETY	VERSION	IPR	IPA
Argessis	V_1	392	675
	V_2	300	584
	V_3	280	575
	Media	**334,2**	**598,6**
Auriu de Ştefăneşti	V_1	325	428
	V_2	345	430
	V_3	328	450

	Media	**328,9**	**426,2**
Augusta	V_1	312	521
	V_2	329	505
	V_3	330	509
	Media	**319,5**	**508,3**
Muscat Adda	V_1	120	255
	V_2	150	260
	V_3	135	249
	Media	**134,0**	**246,6**

The analysis of experimental data on productivity is found that the highest values of relative productivity indices (average) recorded ARGESSIS and golden varieties Ştefăneşti (334, 2 or 328, 9), followed by the values of productivity varieties Augusta 319.5 and 134.0 Adda Muscat. Absolute value indicates the highest productivity is recorded in variety Argessis (598.6) and lowest in Muscat Adda (246.6). These values are close to those obtained in Table vineyard varieties in other years, except for recorded data Ştefăneşti golden variety which has been less studied.
Differences between experimental variants reveals that exerts favorable influence standardization of production by cutting on productivity of varieties (Figure 1).

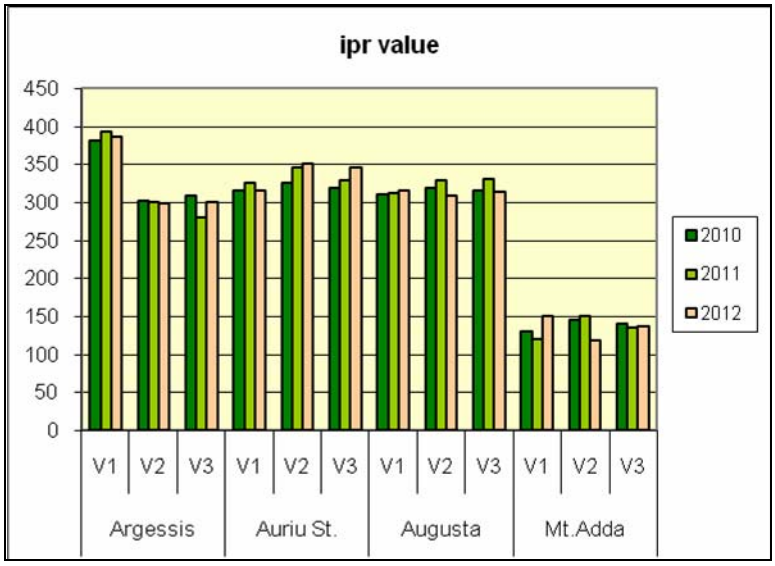

Figure 1. The relative productivity index (IPR) varieties in experiment

Graduation experimental factors determined within each variety, a differentiation of the yields. The maximum values of relative productivity index variations are recorded, which provides development of foliar rich device that provides a large amount of metabolites grains and support their growth. Thus the highest value was recorded for experimental variations in kinds Argessis V_1 and V_2 lowest in the Muscat Adda.

Table 7. Sugar values in table grape varieties in the INCDBH Ştefăneşti-Arges

VARIETY	**VERSION**	**SUGARS g/l**		
		2010	**2011**	**2012**
Argessis	V_1	140,3	138,5	155,2
	V_2	140,8	135,9	151,2
	V_3	139,2	132,5	149,2
Auriu de Ştefăneşti	V_1	140,2	140,9	146,3

	V_2	139,8	138,7	145,6
	V_3	137,6	137,1	143,2
Augusta	V_1	140,1	139,8	147,5
	V_2	139,2	138,7	146,4
	V_3	137,8	139,4	143,2
Muscat Adda	V_1	134,5	132,6	138,4
	V_2	132,5	130,5	139,5
	V_3	130,4	127,9	137,8

Varieties have been studied equilibrium values of the ratio of accumulated sugars and titratable acidity of must: Argessis (2.72 to 2.84), Golden Ştefăneşti (2.63 to 2.71), Muscat Adda (2.25 to 2, 57), Augusta (3.75 to 4.04).

Table 8. Glucoacidimetric index values in the studied period (average 2010-2012

VARIETY	**VERSION**	**INDICATE GLUCOACIDIMETRIC**
		Average 2010-2012
Argessis	V_1	2,84
	V_2	2,72
	V_3	2,72
Auriu de Ştefăneşti	V_1	2,71
	V_2	2,68
	V_3	2,63
Augusta	V_1	4,04
	V_2	3,99
	V_3	3,75
Muscat Adda	V_1	2,43
	V_2	2,57
	V_3	2,25

Taking into account the loads assigned to eye cutting, it is found that the highest values for this index were obtained at lower loads assigned to eye cutting (15-20 buds / vine, respectively V_1 and V_2), where index values gluco-acidimetric ranged from 2.43 to 4.04 for V_1, in all varieties studied and 2.57 to 3.99 for V_2. Follow V_3 (25 buds / vine) which recorded lower values ranging from 2.25 to 3.75.

4. CONCLUSIONS

1. Among the varieties studied in terms of quantity x quality ranks first ARGESSIS variety that can be used as table grapes with Early End Cooking Time for the production of sauce, jam.
2. Good results were recorded and the variety of Ştefăneşti Gold for fresh consumption, whose grape varieties can complement and compete classic Pearl of Csaba, Chassellas wants, being superior to them in terms of production, the commercial aspect (grain size) features de quality (sugars, acidity, indicating gluco-acidimetric).
3. Baked fresh to the consumer, but also to keep over winter lends itself Muscat Adda, who has special qualities in terms of flavor, crisp and grape appearance (color, bloom).
4. As types of cutting in large farms are recommended cutting drill cord 4-6, 2-3 eyes and eye for all varieties studied.
5. For smallholder recommended cuts in the heart and the rod string, provided that the additional work while shortening the rachis, inflorescence normalization green papers such as weeding shoots, partially leafless.

5. REFERENCES

Dejeu L. (2010) Viticultura, Editura Ceres, Bucureşti, 480 p.

Necula Cezarina, Popa Camelia, Petrescu N., Marin Cr. (2010) Valuable table grapes varieties from Stefanesti-Arges wineyard and their agrobiological attributes. USAMV Iaşi, Scientific papers – vol. 53, no .2, series Agronomy.

Necula Cezarina, Popa Camelia, Petrescu N., Marin Cr. (2010) *Valuable table grapes varieties from Stefanesti-Arges wineyard and their agrobiological attributes*. Lucrări Ştiinţifice UŞAMV Iaşi, seria Agronomie, Vol. 53, nr. 2/2010.

Olteanu I. (2000) *Viticultură*. Editura Universitaria, Craiova, 599 p.

Popa Camelia, Necula Cezarina (2003) The new comes Variety Grapes for table Argessis. Annals of University of Craiova, vol VIII (XLIV), p. 235-239.

Popa Camelia., Necula C., Cichi D., Giugea N (2009) Argessis and Golden Stefanesti new varieties for table grapes with high biological strenght. Proceedings of the 32st World Congress of Vine and Wine, Verona, Italy.

Ţârdea C., Rotaru Liliana (2003) *Ampelografie, Volumul II, Soiurile de viţă de vie pentru struguri de masă şi soiurile apirene.* Editura Ion Ionescu de la Brad, Iaşi, 246 p.