

THE QUANTITY AND QUALITY OF GRAPES OF 'PREZENTABIL' TABLE GRAPES VARIETY BY THE INFLUENCE OF BIOLOGICALLY ACTIVE SUBSTANCES

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Abstract

The table grape production is an effective branch in Moldova. Increasing the quality and quantity of table grape is a necessity for society. The purpose of the research from this article is to study the influence of Gobbi Gib 2LG on the quantity and quality of grapes of 'Prezentabil' variety. The research was conducted in the vineyards of the „Terra Vitis” LTd, from Southern wine region in Moldova. Research results have shown that the dose of 0,98 l / ha is most useful for conditions south of Moldova, for 'Prezentabil' variety.

Key words: *Prezentabil, table grape, growth stimulators.*

INTRODUCTION

There are a lot of agricultural branches, including viticulture, that use a new efficient proceeding – which is the use of growth regulators or biological active substances.

All growth regulators (natural and synthetic ones) are organic substances which, if used in low concentrations, are able to cause essential modifications within the growth and development processes of the plant body and incite their regulation. A specific particularity of the regulators action is their capacity to influence on the processes that are not responding on the influence of normal agricultural proceeding (Winkler A.J., 1966 (Уинклер А.Дж., 1966); Wear R.J.,1976; Winkler A.J., 1997; Smirnov K.V. and others, 1987 (Смирнов К.В. и др., 1987).

The use of gibberellins within table grape variety technology in most of the countries around the world (Japan, USA, Russia, Italy, Ukraine, Bulgaria etc.) is an obligatory agricultural process. Treating the inflorescences (within the blooming period, within the postfecundation period) leads to

considerable modifications of the morphological and mechanical bunch particularities and to productivity increase as well as grain quality modifications.

MATERIALS AND METHODS

The purpose of the research was to study the influence of the Gobbi Gib 2LG, produced by „L Gobbi” Ltd., Italy on the table grapes varieties productivity.

To achieve the final purpose it was necessary to track down the following objectives:

- the action of Gobbi Gib 2LG on the table grapes variety Presentabil, on its berry morphological parameters and mechanical properties;
- the action of Gobbi Gib 2LG on the productivity and quality of the grapes;
- finding out the optimal concentration of the Gobbi Gib 2LG which has a more efficient action within the table grapes seedless varieties;

The research in the field of studying the action of Gobbi Gib 2LG as growth regulator needed to increase the productivity and quality of the

grapes was effectuated by “Terra-Vitis” Ltd. located in the Cahul district.

As the object of study it was taken the Presentabil a table grapes variety grafted on the Berlandieri x Riparia SO4 rootstock.

The GG2LG was used by means of treating the vines within different stages of its development: the technology used in Italy (3.6; 4.6 l/ha) – on 8 cm shoots length; one week before the blossom; while blossoming 30% of the bloom; while blossoming 50% of the bloom; while blossoming 80% of the bloom; the treatment of Ø 3-4 mm grains; 8-10 days after the last treating; the technology suggested for Moldova was the treatment of Ø 3-6 mm grains (2,0 and 2,4 l/ha).

RESULTS AND DISCUSSIONS

The reaction of the Presentabil table grapes variety with seeds to the Gobbi Gib 2LG treatment.

Within the control variant the average bunch weight is 503,3; the weight of the berries in the bunch – 494,4; the weight of the cluster 8,9g. The bunch characteristic value (berries weight/cluster weight) - 55,6. The bunch is big, conically-shaped, dense.

The number of berries in the bunch – 167,0 pcs, including- 21 psc. of the undeveloped berries. The berries have an oblong shape with a length of - 24,1; width - 14,7 mm. A 100 berries weight – 395,8 g., The berry characteristic value (pulp weight/berries skin) – 10,1. As a rule, one big seed forms in each berry. The characteristic value of the seeds (pulp weight / seed weight) is rather high and reaches 71,28.

Within Presentabil the mechanical properties of the berries, especially the crushing strength, is higher than seedless varieties and comes up to 2476 g/cm².

The harvest constitutes 3,8 kg/vine. There is a high sugar content in the juice of the berries – 22,6 %, titratable acidity content – 8,9 g/dm³.

The usage of Gobbi Gib 2LG following the Italian technology.

While this type of treating Gobbi Gib 2LG was

used in the postfecundary period (treating Ø grains of 3-4 mm -13.06.2013), (treating after 8-10 days before the last one - 23.06.2013) the bunch weight increased up to 16,4% (GG2LG-0,65 l/ha) and 27,2% (GG2LG-0,82 l/ha); the weight of the berries in the bunch accordingly up to 16,1 and 26,7 %. The cluster weight increased up to 1,4-1,6 times which led to a bunch characteristic value decrease (Table 1, Figure 1).

Under the influence of Gobbi Gib 2LG the number of berries in the bunch increased up to 1,2-1,3 times, but at the same time the quantity of undeveloped berries almost double if compared to the control. The dimensions of the berries, a 100 berries weight is the same as the one of the control, or a bit lower, as far the increase of the number of berries in the bunch brought to a decrease of their dimensions. The characteristic value of the berries is as that of the control or a bit higher.

The crushing strength of the berries is the same as that of the control. The harvest increases up to 1,2 (GG2LG-0,65 l/ha) -1,3 (GG2LG-0,82 l/ha) times. The sugar content is the same as that of the control, or a little higher. At the same time the concentration of the titratable acidity in the berries decreases.

It is important to notice that the biggest differences while using the specimen, if compared to the Witness, were observed in the dose of GG2LG-0,82 l/ha. Within this variant rise the bunch weight and parameters as well as the weight of grains in the bunch which leads to an increase of harvest vine up to 1,3 times. A small increase of seeds characteristic value takes place.

The usage of Gobbi Gib 2LG following the Moldova technology.

Using Gobbi Gib 2 LG within the post fecundation period (treating Ø grains of 3-6 mm -13.06.2013) leads to the increase of bunch weight and the weight of the grains in the bunch up to 1,3 times, whatever the concentration of the specimen. It should be mentioned that took place the increase of the bunch, its length and width, especially in the middle part of it.



Figure 1. The Gobbi Gib 2LG influence on the external appearance of the bunch and berries. The Presentabil variety, „Terra vitis” Ltd., 2013, (Italian technology). The variant of experiment: 1-Control – H₂O; 2-GG2LG-0,65 l/ha; 3-GG2LG-0,82 l/ha

Table 1. The reaction of the Presentabil variety to the Gobbi Gib 2LG treatment within postsecondary period. „Terra vitis” Ltd., 2013, (Italian technology)

Value	The variant of experience					DL 0,95
	Control-H ₂ O	GG2LG-0,65 l/ha		GG2LG-0,82 l/ha		
	\bar{x}	\bar{x}	% to the control	\bar{x}	% to the control	
Bunch weight, g	503,3	586,0	116,4	640,0	127,2	
including - berry	494,4	573,9	116,1	626,2	126,7	
- cluster	8,9	12,1	136,0	13,8	155,1	
Bunch characteristic value (berries weight / cluster weight)	55,6	47,4	-	45,4	-	
Bunch dimensions, cm						
- length	22,0	25,0	113,6	28,0	127,3	
- width / on the top	16,0	20,0	125,0	23,0	143,8	
at the middle	11,0	12,0	109,1	15,0	136,4	
at the bottom	6,5	6,3	98,9	7,0	107,7	
Pedicle dimensions, mm	3,4	6,8	200,0	6,0	176,5	
The quantity of berries per bunch, pcs, total including undeveloped berries	167,0	208,0	124,6	214,0	128,1	
	21,0	43,3	-	47,0	-	
Berry size, mm						
- length	24,1	22,3	92,5	23,6	97,9	
- width	14,7	15,5	105,4	16,3	110,9	
100 berries' weight, g	395,8	368,4	93,1	403,2	101,9	
Berry characteristic value (pulp weight/ skin weight)	10,1	12,3	-	10,3	-	
Seeds characteristic value (pulp weight/ seeds weight)	71,3	73,3	-	77,5	-	
Crushing strength of berries, g/cm ²	2476	2146	86,7	2516	101,6	
Harvest, kg/vine	3,8	4,5	118,4	4,9	129,0	0,49
The content of:						
- sugar, %	22,6	22,0	-	23,3	-	
- titratable acidity, g/dm ³	8,9	8,5	-	8,3	-	

Under the influence of Gobbi Gib 2LG the number of grains in the bunch increased up to 1,5 (GG2LG-0,98l/ha) -1,2 (GG2LG-1,3l/ha) times, and at the same time grain dimensions, in most of the cases, are not bigger than those of the Witness. A 100 grains weight is the same as that of the Witness or a little lower.

The characteristic value of the grain (pulp weight/skin weight) rises up to 1,1-1,2 times;

the characteristic value of the seminal index (pulp weight/seeds weight) is the same as that of the Witness or a little higher (Table 2, Figure 2).

Under the influence of Gobbi Gib 2 LG the harvest increases up to 1,3 times. The sugar content in the grains increases and the the concentration of the titratable acidity decreases.

Table 2. The reaction of the Prezentabil variety to the Gobbi Gib 2LG treatment within postfecundary period. „Terra vitis” Ltd.,2013 (Moldova technology)

Value	The variant of experiment					DL 0,95
	Control -H ₂ O	GG2LG-0,98l/ha		GG2LG-1,3l/ha		
	\bar{x}	\bar{x}	% to the control	\bar{x}	% to the control	
Bunch weight, g	503,3	649,0	129,0	651,5	129,4	
including - berry	494,4	637,9	129,0	640,5	129,6	
- cluster	8,9	11,1	124,7	11,0	123,6	
Bunch characteristic value (berries weight / cluster weight)	55,6	57,5	-	58,2	-	
Bunch dimensions, cm						
- length	22,0	23,3	105,9	22,7	103,2	
- width / on the top	16,0	21,3	133,1	19,5	121,9	
at the middle	11,0	14,7	133,6	11,8	107,3	
at the bottom	6,5	7,0	107,7	7,5	115,4	
Pedicle dimensions, mm	3,4	4,0	117,6	6,6	194,1	
The quantity of berries per bunch, pcs, total including undeveloped berries	167,0	255,0	152,7	196,5	117,7	
	21,0	50,0	-	18,0	-	
Berry size, mm						
- length	24,1	23,5	97,5	24,0	99,6	
- width	14,7	16,0	108,8	16,0	108,8	
100 berries' weight, g	395,8	376,2	95,1	404,6	102,2	
Berry characteristic value (pulp weight/ skin weight)	10,1	11,5	-	12,1	-	
Seeds characteristic value (pulp weight/ seeds weight)	71,3	105,2	-	83,9	-	
Crushing strength of berries, g/cm ²	2476	2445	98,7	2442	98,6	
Harvest, kg/vine	3,8	4,9	129,0	5,0	131,6	0,49
The content of:						
- sugar, %	22,6	23,6	-	21,6	-	
- titratable acidity, g/dm ³	8,9	8,6	-	8,4	-	



Figure 2. The Gobbi Gib 2LG influence on the external appearance of the bunch and berries. The Prezentabil variety, „Terra vitis” Ltd., 2013, (Moldova technology). The variant of experiment: 1-Control – H₂O; 2-GG2LG-0,98l/ha; 3-GG2LG-1,3l/ha

The results of testing *Gobbi Gib 2LG* within the *Prezentabil* variety with seeds show that its action on the vines depends on the soil's biological particularities, treatment concentration and the duration of its usage. Taking into consideration the characteristic values sum (bunch weight and its parameters, the quality and weight of the grains in the bunch) it is necessary to note the variant Gobbi Gib 2 LG - 0,98 l/ha. While this very variant takes place an essential increase of the seed

characteristic value up to 1.5 times which shows the rise of the seedless degree of grains. Using Gobbi Gib 2 LG within the postfecundation period for 3-6 mm diameter grains leads to a harvest increase up to 1,3 times, rise of the seedless berries quantity which allows sugar quantity growth in the juice of the grain and the early ripening. The last one is very important, especially for early maturation sorts.

CONCLUSIONS

In the issue of the received data after using *Gobbi Gib 2LG* within the vitis it may be said that its action depends on the biological particularities of the sorts notwithstanding the method of using it. Within the *Prezentabil* variety the efficiency of the specimen showed through:

1. The rise of the bunch, grains, cluster parameters; also modifies bunch characteristic value (grain weight/cluster weight);
2. Rises the quantity of grains in the bunch up to 1,2-1,7 times, at the same time grain parameters decrease (length, width);
3. The harvest rises up to 1,2-1,3 times if compared to the Witness. Grows the seedless grains quantity; rises the seminal characteristic value which heightens sugar accumulation in the grain and fastens the maturity.

Taking into consideration the obtained results on *Gobbi Gib 2LG* one can confirm that the specimen may be included into the table grape sorts levelling technological system as growth regulator aiming to increase the productivity and the quality of the production based on the 2 schedules:

Within the varieties with seeds (*Prezentabil*):
I schedule (Italian method), through vine spraying, using the specimen within periods:

- ✓ post fecundation period
- II schedule (Moldova method), through spraying the zone of the bunch placement using the specimen only within one single period:
- ✓ post fecundation period

REFERENCES

- Nicolaescu, Gh., Cazac, F., 2012. Producerea strugurilor de masă soiuri cu bobul roze și negru (ghid practic) / Gheorghe, Nicolaescu, Fiodor, Cazac. Chișinău. Elan Poligraf. p. 248
- Nicolaescu, Gh., Cazac, T., Vacarciuc, L., Cebotari, V., Cumpanici, A., Nicolaescu Ana, Hioară Veronica, 2010. Filiera vitivinicola della Repubblica Moldova – situazione attuale e prospettive di sviluppo. Istituto Nazionale per il Commercio Estero – Ufficio di Bucarest, Univ. Agraria di Stato di Moldova; Chișinău. Print-Caro SRL. p. 142
- Nicolaescu Gh., 2013. Particularitățile culturii soiurilor de struguri pentru masa in Italia, Spania și Ucraina. Raport la Forumul Național al Producătorilor și Exportatorilor strugurilor de masă din 08.09.2013
- Wear R.J., 1976. Grape growing. Awilez-interscience publication: New York, Chichester, Brisbane, Toronto p. 371
- Winkler A.J., Cook J.A., Kliwer W.M., Lider L.A., 1997. General viticulture. University of California press. Berkeley, Los Angeles, London p. 710.
- Смирнов К.В., Калмыкова Т.И., Морозова Г.С., 1987. Виноградарство. М.: Агропромиздат. 367 с.
- Уинклер А.Дж., 1966. Виноградарство США. Перевод с англ. Москва: Колос. 638 с.

