THE EFFECT OF APPLYING SHORT CUTS IN FERTILE SPIGOTS AT NOBLE TYPES OF GRAPES

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Abstract

In order to establish the vine culture technology for noble grapes and in order to produce productions superior in quantity as well as in quality three types of noble grapes had been analyzed: Csaba Pearl and Chasslas Dore, with early maturation and Muscat of Hamburg with middle maturation using three types of running forms: Guyot on the halfstem Cordon Cazenave, whirled Cord , the experience including seven variants.

For the study done at the Sântimbreu vineyard in Bihor county, over the period 2005-2008 the following things have been analyzed: the starting in vegetation of the vines, the fertility of the buds, the average weight of the grapes, the total grape production, the commodity production, the composition of the grapes and total acidity.

Key words: grapes, vine plantations, fertile spigots, *Chasslas Dore*, Whirled Cord

INTRODUCTION

In the vine culture technology, the cut in dry represents an important link and many things depend upon it: the level of production, the quality as well as the long life of the vine plantations.

For the vine types of grapes as well as for the noble types of grapes, too, a lot of tests had been done, tests related to the short cuts in fertile spigots, at different forms of running - high and semi-high.

The cut in fertile spigots can be applied especially at the vine species that present the same fertility along the cords. The whirled Cord is of a great importance in comparison with the Guyot and Sylvoz types of cuts because it needs a reduced labour consumption.

The effects of the spigot cuts, in comparison with the fertile link cuts at the Italian Riesling and Merlot types show an increase of the grape production with 21% for the Italian Riesling and with 26% for the Merlot.(Mihalca 1981).

For the noble grapes like: Chasselas dore, Cardinal, Muscat of Hamburg we recommend the fertile spigot cut.(Trapani, 1982).

MATERIAL AND METHODS

The study related to the bevahiour of the noble grape types when applying the fertile spigot cut had been done over the period 2005 – 2008 at Santimbreu vineyard, in Bihor county.

We had in view the behaviour of the different types of grapes when the fertile spigot cut had been performed in comparison with the mixed small cord and cord cut was done, as well as establishing the optimum crop load that can be attributed through this cutting system. The following experimental scheme had been used:

Variant	**Type of cut**	**Crop/fertile elements**	**The eye load/ square meter**
V_1	Guyot on the halfstem	Cords	N*
V_2	Cazenave Cord	Small cords	N
V_3	Whirled Cord	Spigots	N
V_4	Whirled Cord	Spigots	N-4
V_5	Whirled Cord	Spigots	N-2
V_6	Whirled Cord	Spigots	N+2
V_7	Whirled Cord	Spigots	N+4

N* = the eye load recommended for the vineyard

The experience had been placed after the random bud method with six repetitions. Each experimental lot was formed of 20 buds which served for observations and determinations (table 1).

Table 1

Experimental conditions

Type of grape	The year the plantation was founded	The graft supporter	Plantation distances(m)	Recommended weight (N), eyes/m^2
Chasslas dore	1998	Kober 5BB	2.0 x 1.0	14
Csaba Pearl	1998	Little Christmas 2	2.0 x 1.2	16
Muscat of Hamburg	1998	Little Christmas 2	2. x 1.2	18

RESULTS AND DISCUSSIONS

The starting in vegetation of the vines had been influenced by the biological features of each type of grape, by the load attributed through the cut in dry and by the length of the fertile elements (table 2).

Table 2

The eye load, the vine start in vegetation and the fertility of the buds, 2005 - 2008

Type of grape	Variant	The eye crop load /m^2	% Buds starting for vegetation	% Fertile offshoots/ copses	Fertility coefficient	
					relative	absolute
Csaba Pearl	V_1	16	83	56	0.83	1.49
	V_2	16	72	56	0.76	1.35
	V_3	16	82	66	0.82	1.24
	V_4	12	71	60	0.76	1.26
	V_5	14	70	73	0.81	1.11
	V_6	18	76	68	0.75	1.10
	V_7	20	77	75	0.87	1.16
Chasslas dore	V_1	20	76	82	1.40	1.70
	V_2	20	73	81	1.40	1.73
	V_3	20	86	79	1.42	1.80
	V_4	16	84	87	1.40	1.61
	V_5	18	86	87	1.51	1.75
	V_6	22	85	88	1.42	1.61
	V_7	24	71	81	1.34	1.65
Muscat of Hamburg	V_1	16	75	59	0.75	1.28
	V_2	16	76	73	1.00	1.37
	V_3	16	75	60	0.89	1.23
	V_4	12	81	63	0.80	1.27
	V_5	14	78	63	0.73	1.15
	V_6	18	75	58	0.70	1.21
	V_7	20	70	72	0.86	1.20

The types of grapes analyzed in the present work show a low and middle vigour (Csaba Pearl, Chasslas dore, Muscat of Hamburg); they also present a superior percent of the buds that headed for vegetation in comparison with the vigorous types of grapes.

For the same fruit-bearing load, the starting into vegetation is superior for the small and middle vigour types of grapes and for the variants that use a fertile spigot cut in comparison with the types of grapes to which the small cord or the cord cut was applied.

At the spigot cut, the percent for the starting into vegetation of the first and second eye is higher in comparison with the eyes of the same rank, eyes situated on small cords or on cords, especially in the case of eye in position number two.

On the cords with four eyes the starting into vegetation is lower for the eye in the inferior position and higher for the eye in the apical position.

For the cords that have 12 to 15 cords, the starting into vegetation increases from the base until the bud in the third position, maintaining itself to high values along the rest of the cord length.

Fertility of the offshoots/copses. For the types of grapes that have an early maturation (Csaba Pearl, Chasslas dore) and for the grapes that have a middle maturation (Muscat of Hamburg) the percent of fertile copses determined at the same eye load presents equal values for the whirled cord; these values are equal with the ones registered in the case of the other two types of cuts(table 2).

Following the fertility of the copses and the relative fertility coefficient, determined according to the length of the fertile elements, the following things can be noticed:

- At the spigot cut, the relative fertility coefficient has got higher values in comparison with the same rank eyes from the elements 4 and 12 (especially for the eye in the second position), without reaching the maximum values determined at some of the eyes on the cord.

- For the four eyed small cords the value of the relative fertility coefficient increases from the base eye towards the superior positioned eyes.

- Along the length of the cord the maximum value of the relative fertility coefficient is realized differently according to the type of grape. Thus, for the Csaba Pearl and Chasslas dore types the value of the relative ferttility coefficient increases from the base eye towards the eye in the 5th or 6th position then it stabilizes itself and it maintains itself in close limits. For the Muscat of Hamburg type the relative fertility increases to the 7th eye then it suddenly decreases reaching reduced values for the eyes in the 9th up to the 12th position.

Average weight of the grapes. (table 3). Like in the case of the fertile copses or in the case of the relative fertility coefficient, the average weight of a grape determined by the type of cut is modelled under the influence of the studied types of grapes. At the studied types of grapes the average weight of a grape registers values close to the whirled Cord or to the Cazenave Cord or to the Guyot on the half-stem

Table 3

Grape production and crop quality (average data 2005-2008)

Type of grape	Variant	Grape production				Production quality		
		No. of grapes	The average weight of the grape - g	t/ha	%	Commodity production	Sugar g/l	Acidity g/l
Csaba Pearl	V_1	29	119	12.0	100	64.9	118.0	3.2
	V_2	23	126	10.0	83	75.1	126.0	3.9
	V_3	31	116	12.4	103	74.1	124.2	3.8
Chasslas dore	V_1	43	101	17.4	100	59.2	146.0	4.4
	V_2	46	100	18.4	106	64.4	149.0	4.6
	V_3	44	107	18.8	108	59.5	143.0	4.1
Muscat of Hamburg	V_1	19	246	22.7	100	56.8	120.6	4.5
	V_2	25	189	22.9	101	55.2	119.0	4.7
	V_3	18	249	21.7	95	60.2	119.1	4.8

The average grape weight and the production afferent to a bud (gram/eye) presents maximum values when the fertile cord cut is performed. When the spigot cut is performed the average weight of the grapes as well as the production afferent for an eye registers superior values in comparison with the same rank eyes from the small cords and from the cords.

Total grape production (table 3), as a resultant of the interaction between the offshoot load, the relative fertility coefficient and the middle weight of a grape, it emphasizes the fact that the types of grapes to which the cut in fertile psigots had beeen done leads to productions close to those realized at the currently done types of cuts: Csaba Pearl, Chasslas dore, Muscat of Hamburg.

Commodity production. (table 3) . For the studied types of grapes that have a middle and early maturation the use of the whirled Cord did not lead to differences related to the middle weight of a grape, there were no differences related to the grape production either.

Composition of the grapes. The sugars concentration (table 4) shows a slight decrease tendency from the long cut towards the short cut; this tendency becomes more obvious in the case of the whirled Cord with a load amplified with 2 eyes/ square meter. The decrease of the sugar content in the grapes can be due to a prolonged offshoot growth, fact which leads to a delay of the maturation process.

The total acidity is greatly influenced by the fertile spigot cut in compoarison with the two types of cuts taken into consideration and studied.

CONCLUSIONS

Through the spigot cut the percent of buds heading for vegetation is higher in comparison with the percent registered in the case of the same rank eyes situated on small cords and on cords without being able to reach the maximum values from the cords. A similar situation is noticed in the case of the relative fertility coefficient or in the case of the average weight of a grape.

In the case of the whirled Cord cut on the whole assembly of the hub equal values can be noticed, values equal with the ones determined for Guyot on the halfstem and with cazenave Cord for the percent of fertile offshoots for the studied types of grapes. A similar situation is registered in what the relative fertility coefficient is concerned.

The application of the cuts in the fertile spigots leads to equal results of the average weight of the grapes for the middle and early maturation type of grapes.

In what the average production per hectare is concerned for the middle and early maturation type of grapes the whirled Cord leads yto

obtaining productions close to those registered in the case of the Guyot halfstem cut and Cazenave Cord, at the recommended weight for the respective type.

In the case of the early and middle maturation types of grapes the commodity production is not negatively influenced by the spigot cut.

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