THE BEHAVIOR OF GRAPE VINE VARIETIES GELU AND PAULA AT GRAFTING

COMPORTAREA LA ALTOIRE A SOIURILOR DE VIȚĂ DE VIE GELU ȘI PAULA

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Abstract. *Table grapes present some specific biological properties that distinguish them from wine grapes. The high production potential, the production being influenced in particular by choosing the best combinations of scion - rootstock, knowing that rootstock can affect both production and quality, is very important. High and very high vigor of the vines requires the use of certain varieties of rootstock with the same vigor that can support high production potential. In this work, two new creations of grape vines obtained at SCDVV Iasi, respectively Gelu and Paula were studied, in terms of their behavior after grafting, compared to a reference variety, Aromat de Iaşi. The reaction to grafting and the behavior during nursery period emphasized that the two varieties had a good behavior, between 73 and 88% of grafted and forced vines presented circular callus and new shoots, lower values than the control variety (92%), and the STAS obtained vines had values between 44-47% at Gelu, 46-55% at Paula, also lower than control variety Aromat de Iași(49 - 54%).*
Keywords: *grapevine varieties, rootstock, grafting, nursery*

Rezumat. *Soiurile de struguri pentru masă prezintă unele însuşiri biologice specifice, care le diferențiază de cele pentru struguri de vin. Potențial de producție ridicat, nivelul de producție al acestora fiind influențat în special, de alegerea celei mai bune combinații altoi-portaltoi, ştiut fiind faptul că portaltoiul influențează atât producția cât şi calitatea acesteia. Vigoarea mare şi foarte mare de creştere a butucilor, impune folosirea unor soiuri de portaltoi cu aceeaşi vigoare, care să susțină potențialul ridicat de producție. In lucrare au fost luate în studiu două creații noi de viță de vie obținute la SCDVV Iaşi Gelu şi Paula şi studiate sub aspectul comportării lor la altoire, față de soiul martor Aromat de Iaşi. Comportarea la altoire şi în şcoala de vițe, evidențiază faptul ca cele două soiuri au avut un comportament bun, între 73 şi 88% din vițele altoite şi forțate având calus circular şi lăstari porniți, valori inferioare soiului martor (92%), iar randamentul în vițe STAS a avut valori cuprinse între 44 - 47% la soiul Gelu, 46 - 55% la soiul Paula, de asemenea, mai mici decât soiul martor Aromat de Iaşi (49 - 54%).*
Cuvinte cheie: *soi de viță de vie, portaltoi, altoire, şcoală de viță de vie*

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INTRODUCTION

Table grape varieties have sime specific biological characteristics, that differentiate them from grape varieties used for wine-making. Knowing these characteristics has a major importance being the basic line for elaborating specific cultural technologies capable of insuring high and constant yields, qualitative and efficient from an economical point of view (Calistru și Damian, 1986).

The different aspects of grafting were studied, over the years, by many researchers. Juncu, in 1958, underlines a good grafting affinity between rootstock Riparia gloire and the very good rooting capacity of rootstock Kober 5BB. Baltagi (1960-1968) underlines the influence of the maturation degree of the wood on calus formation, roots development, groth and maturation of vine shoots. These conclusions were confirmed by the studies made by Văleanu et al., 1973. Oşlobeanu et al., 1975, in Murfatlar conditios, proving the superiority of rootstock Riparia Grand Glabre, 44 and 53 Malegue and Riparia 106.8 MG concerning the percentages of STAS vines obtained (Dobrei și colab., 2005).

Grecu (1990) focuses in the superiority of the rootstock Ru 140 that insured a high yield of STAS vines. In SCDVV Bujoru, Simion underlines the excellent grafting behaviour of Ru 140 as well as rootstock SO_{4-4}. Calistru et al., 1994 recommend the use of rootstock SO_4 for Aromat de Iași grape variety in Iași vineyard. Profir (1997) reccomends for viticultural center Copou Iaşi the use of SO_4 and Ru 140, with better grafting behaviour and yields.

MATERIAL AND METHOD

The studied table grapes varieties, respectively Gelu, Paula and control sample Aromat de Iași have been grafted on the same rootstock, namely Berlandieri x Riparia selection Oppenheim 4, clone SO_{4-4} and were forced in the same conditions. Temperatures of 32°C and 85% humidity for the first 3 days were used, while beginning with the fourth days, temperatures were brought down to 28°C, thus the average periof for forcing was of 15 days.

After forcing, the grafted vines (fig. 1) were acclimatised for 24 – 48 ore at temperatures of 8 – 10°C, following quality classification that took into account the existing shoot and the existing circular calus (fig. 2).

Fig. 1 - Grafted cuttings bins at the end of forcing

Fig. 2 - The aspects concerning caluss and shoots formation on grafted cuttings after forcing process is finished

RESULTS AND DISCUSSIONS

The classification of grafted vines showed that Gelu and Paula grape varieties had a goood behaviour, nevertheless inferior to that of control variety, Aromat de Iaşi.

Table 1

Behavior to forcing of the varieties concerned

Studied elements	Paula			Gelu			Aromat de Iaşi		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
Total vines, %	100	100	100	100	100	100	100	100	100
Vines with circular calus and shoot, %	84	80	73	86	88	78	90	92	91
Vines with circular calus without shoot, %	12	10	15	7	6	10	6	4	5
Vines with partial calus without shoot, %	7	6	6	4	2	6	1	1	1
Rejects , %	7	4	6	3	4	6	3	3	3

The analysis has shown that, in the three years of research, Paula grape variety had an average of 79% grafted vines with circular calus and shoot, Gelu grape variety presented 83% grafted vines with circular calus and shoot , both under the average of Aromat de Iaşi with 92% quality grafted vines.

Vegetative development in the nursery. The analysis made during intense growth period showed that the grafted vines had good growth potential, higher in 2013 than in 2014. The measurements regarding the average length of shoots in the nursery show that Gelu grape variety, grafted on rootstock Berlandieri x Riparia selection Oppenheim 4, clone SO_{4-4}, had the biggest growths, 63,6 cm in

2012, 70,3 cm in 2013 and 59,5 cm in 2014, the average lengths of a shoot being superior to that of control sample Aromat de Iaşi with 57,3 respectively 51,0 cm (fig. 3).

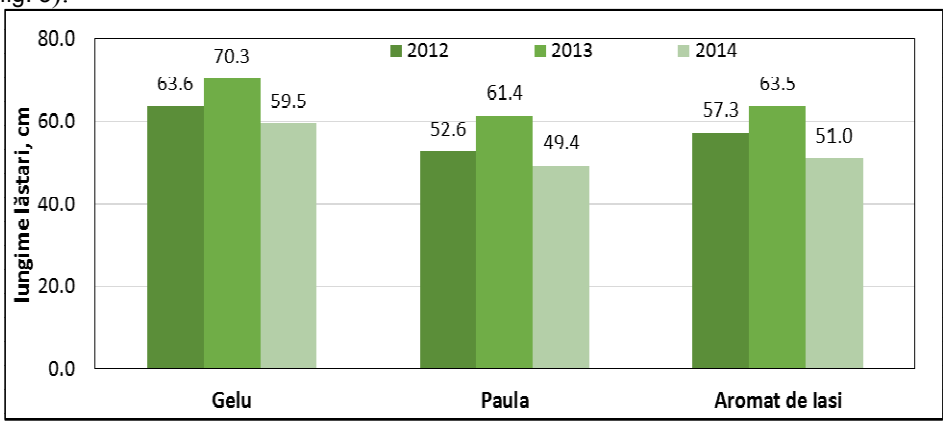

Fig. 3 - The average lenght of shoots in the wine-growing nursery

Paula grape variety, grafted on the same rootstock, had inferior values of the shoots' lenght (49,4 and 61,4 cm) compared to the control sample. These values show that the analysed varieties, including the control sample, had favourable climatic conditions and proper agrophytotechnical measures: phytosanitary measures, irrigation, soil tillage.

Standard vines yield. At the end of the vegetation period, after the grafted vines are dug out of he nursery and classified, biometrical measurements are made regarding the total number of roots, roots with a diameter over 2 mm, length of the matured shoot and width of shoot at the second internode.

Table 2

Quality of the vines produced in the wine-growing nursery in the year 2012

Grape variety	Repetition	STAS vines, %	No. Roots/ vine		Length of matured shoot, cm	Width of shoot at the 2nd internode, mm
			total	Ø> 2 mm		
Gelu	1	44%	7,51	2,80	26,30	6,15
	2		7,30	2,63	28,25	6,30
	3		8,40	2,54	27,8	5,75
	Average		7,74	2,66	27,45	6,06
Paula	1	46%	8,35	3,15	25,30	5,18
	2		8,80	3,00	22,45	6,00
	3		9,05	2,70	23,35	5,95
	Average		8,73	2,95	23,70	5,71
Aromat de Iaşi (control)	1	49%	8,16	2,45	23,50	6,15
	2		9,85	2,10	24,60	5,90
	3		10,66	2,15	24,85	6,00
	Average		9,55	2,23	24,32	6,01

Based on all measurements for the studied grafted varieties, the yield of STAS vines was obtained: 44 - 47 % for Gelu variety, 46 - 55% for Paula variety, both lower than the results obtained for the control sample Aromat de Iaşi with a yield of 49 - 56% (tab. 2, 3 și 4).

The studies regarding the rooting capacity of the used rootstock Berlandieri x Riparia selection Oppenheim 4, clone SO_{4-4} and its influence on the graoe variety, length of the matured shoot and diameter of the shoot at the 2nd internode, showed that the grafted vines have at least 7 roots/vine, at least 2 with over 2 mm diameter, the matured length of the shoot being over 20 cm, the diameter of the second internode being between 5 and 6 mm. These results express a good compatibility between the two grafting partners, aspect which recomend their use in the grafting process.

Table3

Quality of the vines produced in the nursery in the year 2013

Grape variety	Repetition	STAS vines, %	No. Roots/ vine		Length of matured shoot, cm	Width of shoot at the 2nd internode, mm
			total	Ø> 2 mm		
Gelu	1	46%	8,30	3,33	28,92	6,10
	2		8,00	2,84	30,88	5,95
	3		9,15	2,75	28,75	6,12
	Average		8,48	2,97	229,52	6,05
Paula	1	51%	9,25	2,75	23,60	6,10
	2		8,40	3,05	24,05	5,20
	3		9,10	2,80	22,75	5,30
	Average		8,92	2,87	23,47	5,53
Aromat de Iaşi (control)	1	54%	10,15	2,30	23,40	5,30
	2		9,30	1,85	25,25	6,00
	3		11,25	2,25	24,35	5,25
	Average		10,23	2,13	24,33	5,52

Table 4

Quality of the vines produced in the nursery in the year 2014

Grape variety	Repetition	STAS vines, %	No. Roots/ vine		Length of matured shoot, cm	Width of shoot at the 2nd internode, mm
			total	Ø> 2 mm		
Gelu	1	47%	8.48	2.92	28.90	6.47
	2		7.48	2.48	30.48	6.46
	3		9.28	2.96	29.32	5.72
	Average		8.41	2.79	29.57	6.22
Paula	1	55%	9.12	3.00	22.48	5.08
	2		9.00	3.16	24.92	4.73
	3		8.28	2.64	24.44	4.69
	Average		8.80	2.93	23.95	4.83
Aromat de Iaşi (control)	1	56%	8.28	2.40	23.12	6.28
	2		12.12	1.52	25.36	4.45
	3		9.68	2.04	24.98	5.01
	Average		10.03	1.99	25.17	5.25

CONCLUSIONS

1. Nursery behaviour during 2012-2014 shows that the two grape varieties had between 73 and 88% grafted vines with circular calus and shoots, nevertheless inferior to that of the control sample - 92%.

2. STAS vines yield was between 44 - 47% at Gelu grape variety, 46 - 55% at Paula grape variety, lower than the control sample, Aromat de Iaşi, with values of 49 - 54%.

3. Therefore, the two table grape varieties Gelu and Paula, created at SCDVV Iași, are considerd well adapted to the specific conditions of the ecosystme in which they have been created. They are also recommended for culture on wide surfaces in the North-East of Moldova or other regions with similar conditions.

4. Using these varieties insures fresh table grapes in a period when the varietal deficit is high.

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