Quality Evaluation of Selection Oppenheim 4 Rootstock Clones Used to Produce Grapevine Planting Material, Depending on the Applied Agrotechnics

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Abstract. The implications of various vines practices (trellised or grown flat on the ground) influence the degree of canes maturations. In the present paper are analyzed the implications of various vines practices (using support systems-Romania, without means of support-France) on the maturation degree of canes of different clones belonging Selection Oppenheim 4 Rootstock (SO4) rootstock used in the grafting process. Have been tested rootstock clones of SO4 from France (clones 5, 18, 102, 203, 762) and Romania (clone 4). Carbohydrate content in clones studied recorded values between 13.81-16.07 g%, these values ranking rootstock clones in category sufficiently matured (between 14 to 16 g%) to good matured (over 16g %). By using the support system is obtain a good mature stock with a uniform diameter.

Keywords: *agrotechnical practices, carbohydrates, SO4 rootstock clones*

Introduction. An very important criterion in achieving good grafting and finally, a quality grapevine planting material is the maturation degree of the wood (carbohydrate content) of the two partners grafting (scion and rootstock) (Hunter *et al.*, 1996). The processes of rootedness and callus formation are energy-intensive processes that can not be taken over than through hydrolysis of poliglucid located in reserve rootstock cuttings. Therefore, the material with total carbohydrate content below 12% is rejected from propagating (Iliescu *et al.*, 2012; Corbean, 2011). Worldwide, rootstock mother material is either trellised or grown flat on the ground. When rootstocks are not trellised, the flat shoots mostly form a thick carpet on the ground. Some shoots are therefore fully exposed to sunlight, some only receive diffused sunlight and others are growing in complete shade. This has a direct effect on the reserve and ripeness status of shoots. Shoots therefore do not ripen uniformly and this may eventually lead to varying callus success (Hunter *et al.*, 2004).

Aims. In the present paper are analyzed the implications of various vines practices (using support systems-Romania, without means of support-France) on the maturation degree of canes of different clones belonging SO4 rootstock used in the grafting process.

Materials and Methods. Have been tested rootstock clones of SO4 from biological category Certificate existing in mother plantation from France (clones 5, 18, 102, 203, 762) and Romania (clone 4), the culture system practiced being trellised (SCDVV Blaj - Romania) and without means of support (Morisson Couderc - France). The tests were performed on canes from the harvest 2012 and 2013. Establish the quality of rootstock used for the production of grapevine planting material was made by determining the carbohydrate content (extraction of sugar with ethyl alcohol and starch with perchloric acid and treated with anthrone; was used UV-VIS Spectrophotometer at a wavelength of 620nm), the humidity and the diameter of canes.

Fig. 1. Geographical position and climatic conditions of the studied rootstocks plantations

Tab. 1. The quality of canes from SO4 rootstock clones

Variant	Harvest year	Canes diameter (mm)	Humidity (%)	Sugar content (g%)	Starch content (g%)	Total carbohydrates (g%)
Clone 4	2012	7.23 ± 0.47	42.2 ± 1.9 b ^a	7.30 ± 0.82 c	8.36 ± 0.49 a	15.65 ± 1.26 ab
	2013	8.16 ± 0.83	47.1 ± 1.0 a	10.98 ± 0.97 a	3.10 ± 0.46 e	14.08 ± 1.09 c
Clone 5	2012	8.97 ± 1.66	39.9 ± 1.5 cd	10.37 ± 0.49 ab	5.70 ± 0.20 b	16.07 ± 0.35 a
	2013	7.16 ± 0.01	39.3 ± 0.1 d	10.42 ± 0.01 ab	3.39 ± 0.01 de	13.81 ± 0.01 c
Clone 762	2012	8.37 ± 3.01	42.4 ± 1.8 b	10.10 ± 0.66 b	4.30 ± 1.01 cd	14.40 ± 1.47 bc
	2013	7.77 ± 0.37	41.4 ± 0.9 bc	10.73 ± 0.12 ab	4.31 ± 0.81 cd	15.05 ± 0.69 abc
Clone 18	2013	7.32 ± 0.01	39.8 ± 0.1 cd	10.51 ± 0.01 ab	5.30 ± 0.01 bc	15.81 ± 0.01 ab
Clone 102	2013	8.11 ± 0.01	43.4 ± 0.1 b	9.83 ± 0.01 b	5.04 ± 0.01 bc	14.87 ± 0.01 abc
Clone 203	2013	7.56 ± 0.53	41.6 ± 0.9 bc	10.55 ± 0.58 ab	4.62 ± 0.65 c	15.17 ± 0.08 abc
Sig.		p < 0.000	p < 0.000	p < 0.000	p < 0.000	p < 0.000
Variety		ns ^b	***	***	***	***
Year		ns	*	***	***	**
Clone x Year		ns	***	***	***	*

^aAverage value ± standard deviation (n = 3). Different letters are significantly different for $P \leq 0.05$. The difference between any two values, followed by at least one common letter, is insignificant. ^bSignificance of variety, year of harvest and interaction variety x year was tested for $P \leq 0.05$ (*), $P \leq 0.01$ (**), and $P \leq 0.001$ (***).

Results and Discussion. Regardless of culture system practiced rootstock the diameter of canes at all clones tested have recorded values between 7.23-8.97 mm, values that correspond into force STAS. The influence of ecoclimatic factors (Fig. 1) as well as variety of clones had no significant effect on the diameter; the differences between clones were given by the green works applied in culture (Tab. 1). Both the genotype and climatic conditions of the experimental years had significant effects on carbohydrate content. It was found that the highest effect was given by the clone variety. Carbohydrate content in clones studied recorded values between 13.81-16.07 g%. According to Hunter *et al.* (2004) and Iliescu *et al.* (2012) these values ranks rootstock clones in category sufficiently matured (between 14 to 16 g%) to good matured (over 16 g%).

Conclusion. By using the support system is obtain a good mature stock with a uniform diameter; carbohydrate accumulation may be influenced by performing green work during vegetation period.

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