APPLYING THE MAIN GREEN OPERATIONS IN THE VINE VARIETY COARNA NEAGRA AT THE DIDACTIC STATION IN TIMISOARA, ROMANIA

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ABSTRACT
Vine cultivation has had a long tradition in Romania; it has been cultivated from times immemorial, as proven by the fossils found here and dated back to the Tertiary Era. The viticulture of the future will be different from the present one: it will take into account environmental factors, production means rationalisation factors, so that both agricultural produce quality standards and environmental protection be observed. In this paper, we present the regulation of growth and fructification processes in the grapevine variety Coarna Neagra, a Romanian table grape variety very much appreciated for its taste. During vegetation, we conducted works and operations in green on the vine. Without strict cultivation technology measures that complete dry cuttings aiming at a better distribution of the vegetation for a larger photosynthesis area capable of valorising the productive potential of the grapevine. Research aimed at the monitoring of the impact of these works and operations in green on both amount and quality in the table grape variety Coarna Neagra that answer favourably to these works. The variants that yielded the best results compared to the control variant were Variant 16, in which we applied all operations in green (rs + cst + css + cys), followed by Variant 15 and Variant 14 (rs + cst + cys).

Keywords: operations in green, grapes, cutting young shoots, cutting secondary shoots, cutting stem tips

INTRODUCTION

Operations in green, as well as operations in dry, aim at regulating the growth and fructification processes, at easing other agro-technical measures, at prolonging the longevity of the vines, and at improving the production quality. Unlike other grapevine varieties, Coarna Neagra is a medium production grapevine variety. This is why we have undertaken the task of studying it. We monitored, besides dry cuttings, the works and operations in green that avoid damage and correct the faults made in dry cutting, developing without great difficulty relationships favourable to fructification between the aerial and root systems and changing the relationships between fertile shoots and infertile shoots in favour of the former. Though made for two millennia now, some of these works and operations have not been clarified yet. Numerous researchers have focused on the cuttings in green (DOBREI ET AL., 2011; DOBREI ET AL., 2005; POP NASTASIA 2010).

MATERIAL AND METHOD

In the soil and climate conditions of the Didactic Station of Timisoara, Romania, we studied the combined application of operations in green that proved to be the best in the trials concerning removing shoots, cutting stem tips, cutting secondary shoots and cutting young shoots in the grapevine variety Coarna Neagra in an 18-year old vineyard.
We have studied this grapevine variety since 2011 because of its poor productions: the low level of production could be explained by the fact that this variety has functional female flowers, as in the grapevine variety Coarna alba, which subjects it to cross-fecundation.

Cross-fecundation success depends mainly on the weather during blooming and on the partner grapevine varieties that make up the mixture of cultivated varieties.
The experiment was carried out on the grapevine variety Coarna Neagra starting with the year 2011-2012.

The experimental variants we studied were as follows:

V 1 – CONTROL
V 2 – cutting young shoots (cys)
V 3 – cutting secondary shoots (css)
V 4 – cutting secondary shoots and cutting young shoots (css + cys)
V 5 – cutting stem tips (cst)
V 6 – cutting stem tips and cutting young shoots (cst + cys)
V 7 – cutting stem tips and cutting secondary shoots (cst + css)
V 8 – cutting stem tips, cutting secondary shoots and cutting young shoots (cst + css + cys)
V 9 – removing shoots (rs)
V 10 – removing shoots and cutting young shoots (rs + cys)
V 11 – removing shoots and cutting secondary shoots (rs + css)
V 12 – removing shoots, cutting secondary shoots and cutting young shoots (rs + css + cys)
V 13 – removing shoots and cutting stem tips (rs + cst)
V 14 – removing shoots, cutting stem tips and cutting young shoots (rs + cst + cys)
V 15 – removing shoots, cutting stem tips and cutting secondary shoots (rs + cst + css)
V 16 – removing shoots, cutting stem tips, cutting secondary shoots and cutting young shoots (rs + cst + css + cys)

RESULTS AN DISCUSSIONS

In green works and operations in viticulture can be grouped depending on the frequency of execution as follows: current in green works and operations, rare in green works and operations and table grapevine specific in green works and operations.
We have taken into account some of the current in green works and operations – removing shoots, binding shoots and cutting young shoots – and some of the rare in green works and operations – cutting stem tips and cutting secondary shoots.
The grapes are large, cylindrical-conical conical, with tightly-set drupes in the cluster. The drupe is large, ovoid, with a thin skin, coloured in black-reddish and with a specific grassy taste.
Its vegetation period is long – 180-200 days – ad it has heat requirements. It is extremely vigorous and it has medium fertility. This is the reason why we have also made in green works and operations in the grapevine variety Coarna Neagra.
The grapes accumulate medium amounts of sugars – 15-160 g/L, with constant acidity of 4-4,5 g/l H_2SO_4.
Production results are presented on *Table 1*.

Table 1. Significance of grape production differences between experimental variants

No.	Variant	Grape production (kg/vine)	Compared to the experimental mean	
			Relative value (%)	Significance of the difference
1.	V 1 – Experimental mean	2.67	100.00	Control
3.	V 2	2.18	81.44	-0.49
4.	V 3	1.97	70.98	-0.77
5.	V 4	2.04	76.21	-0.63
6.	V 5	2.96	110.58	0.28
7.	V 6	3.12	116.56	0.44**
8.	V 7	2.55	95.26	-0.12
9.	V 8	3.26	121.79	0.58***
10.	V 9	2.14	79.95	-0.53
11.	V 10	2.00	74.71	-0.67
12.	V 11	2.30	85.92	-0.37
13.	V 12	2.24	83.68	-0.43
14.	V 13	3.28	122.54	0.60***
15.	V 14	2.94	109.83	0.26
16.	V 15	3.46	129.26	0.78***
17.	V 16	3.80	191.96	1.12

$DL_{5\%}$	$DL_{1\%}$	$DL_{0.1\%}$
0.29	0.39	0.52

Table 1 shows that, if we compare the variants with the mean of the variants over the entire experiment (2.67 kg/vine) as a control, we can see that the Variant 16, in which we applied a complex of in green operations (rs + cst + css + cys) overruns the control with 1.12 kg/vine.

This is followed by Variant 15 (rs + cst + css) with 3.46 t/ha and by Variant 13 (rs + cst + cys) with 328 kg/vine with 0.60 kg/vine.

Analysing the probability limit, we can see that, of the four operations in green we studied, only three – removing shoots, cutting stem tips and cutting secondary shoots – have a significant efficacy in production increase.

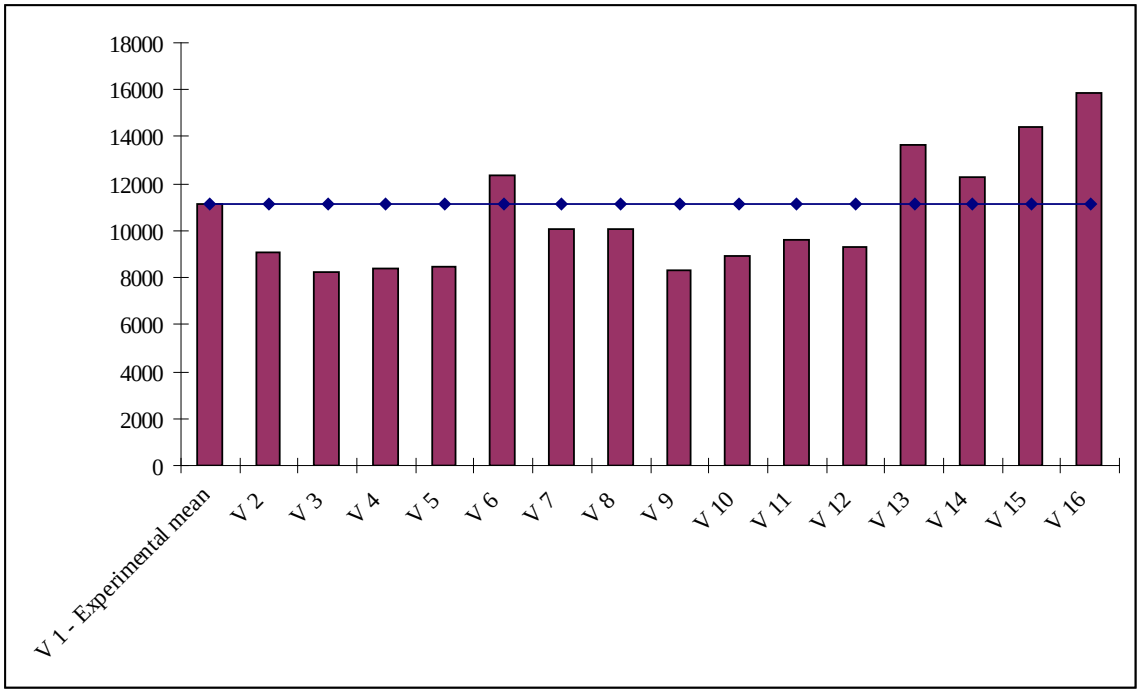

Figure 1. Grapevine production in the experimental variants in the variety Coarna Neagra

Analysing *Figure 1* above, we can see that grapevine production in t/ha increased in the variants V 16, V 15, V 13, V 6 and V 14.

CONCLUSIONS

Applying a complex of operations including removing shoots, cutting stem tips, cutting secondary shoots and cutting young shoots in the grapevine variety Coarna Neagra is more effective in increasing production than applying these operations separately.

Removing useless shoots in the herbaceous phase, removing growth tips in the main shoots around blooming and when there are 4-6 leaves results in maximum effect.

We can obtain, in the grapevine variety Coarna Neagra significant increases of production of 900 kg/ha by removing shoots upon fructification of shoots, and by cutting secondary shoots upon third fructification.

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