

**ASSESSMENT OF SOME AGROBIOLOGICAL AND TECHNOLOGICAL
DESCRIPTORS WITHIN THE CLONAL SELECTION APPLIED
TO AUGUSTA AND VICTORIA VARIETIES**

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ABSTRACT

This paper presents the agrobiological and technological results obtained during the first stages of the clonal selection applied to the Augusta and Victoria varieties. 10 clonal selections of both varieties of table grapes were studied. The determinations and analyzes consisted in the evaluation of agrobiological descriptors, calculation of absolute and relative fertility coefficients. Physico-mechanical analyzes were carried out, consisting in the evaluation of the number of berries, the weight of the pulp, the weight of the skin, of the seeds in one kilogram of grapes. The clonal selections Augusta 2 and 8 stood out for their fertility of 65% and 59%, respectively, but also for their high values of the absolute and relative fertility coefficients Afc - 1,3, Rfc - 0,83 respectively Afc - 1,3, Rfc - 0,27. Regarding the clonal selections Victoria 4 and 10 stood out for their fertility of 76% and 77%.

INTRODUCTION

The efficiency of the selection and the time when it can be carried out differ depending on the heredity of the tracked traits. Thus, for traits whose hereditary expression is qualitative, the selection is very easy and can be performed by observing the presence or absence of the respective trait. A trait determined by a recessive allele can be fixed by a simple choice and reproduction of the selected organism. In the situation where the desired character is determined by a dominant gene, several years of recurrent selection are necessary to be sure of the genetic fixation of the respective trait. For traits with quantitative heredity, the problem of selection is more complicated, in the sense that a larger amount of material is needed for the selection to be effective and the moment of starting the process cannot be very early (Leonte 2011).

For a favorable selection response, breeders must identify biological material that exhibits specimens with good production capacity, maximize heritability through a correct application of experimental technique, use a feasible intensity of selection, and select populations with sufficient variability, at least for the traits to be improved. In the selection process, it is particularly important that heritability is interpreted correctly and, above all, that its limits are taken into account (Brown & Caligari 2009).

MATERIAL AND METHODS

The varieties subject to clonal selection *Victoria* and *Augusta* are among the most important varieties for table grapes grown in Stefanesti. These cultivars were distinguished by a series of qualitative characteristics, production and adaptability to different environmental conditions.

The identification, selection and marking of valuable elites has been carried out in plantations for over 20 years. This consisted in the selection of 10 valuable vegetative descendents, originating from the plants that stood out for their special characteristics within the population.

The main objective pursued through the clonal selection of the varieties studied was to obtain clones with high productivity, increased tolerance to climatic factors, harvest quality which would exceed the vine plants from the plantation. After a three-year field study in the plot of clonal elites, through which repeated measurements and analyzes were carried out on each selected individual, it was found that at least one elite was superior to the population in terms of the average weight of bunches and berries.

Observations, determinations, analyzes regarding the clonal elites were carried out individually per vitis plant. The determinations and analyzes consisted in the evaluation of agrobiological descriptors: number of inflorescences per plant, number of fertile shoots, fertility evaluation, calculation of absolute and relative fertility coefficients. Determinations made during the vegetation period on the elite and witness variety: the loading of the buds per plant, the number of viable buds on each plant, percentage of dead buds, the number of shoots (total and fertile), number of inflorescences per plant, number of bunches per plant, physico-mechanical analysis of a kilogram of grapes: number of berries, number of seeds, rachis weight, pulp weight, skin weight, seeds weight.

RESULTS AND DISCUSSIONS

Within the populations of the two varieties subjected to clonal selection, several elites were selected (figure 1, 2).

The selection is completed in the laboratory after performing biometric measurements and chemical and technological analyses, retaining only the specimens that accumulate optimal values for most of the characters and properties sought, among which the weight of the useful product is mandatory (Leonte 2011).

In the spring, rooted cuttings were obtained from the grafting cords from the elites plant, which were planted, distinctly, on each elite separately in the comparative plot of clones.



Figure 1. Clonal elite Augusta 7



Figure 2. Clonal elite Victoria 10

This is the result of special climatic conditions, with absolute minimum temperature deviations in spring, of an unbalanced water regime. All this strongly impacted the productivity, quality and health indices of the harvest (table 1, 2).

Table 1

Viability and fertility of fruit buds

Varians	Total number of buds	Total burst buds	Fertile shoots	Sterile shoots	Total inflorescences	Fertility %	Cfa	Cfr
Augusta 1	30	28	11	14	14	39	1,2	0,50
Augusta 2	33	31	20	11	26	65	1,3	0,83
Augusta 3	30	28	12	16	13	43	1,0	0,46
Augusta 4	30	25	15	16	18	48	1,2	0,58
Augusta 5	29	28	13	15	14	46	1,0	0,50
Augusta 6	31	30	13	17	15	43	1,1	0,50
Augusta 7	26	23	11	12	11	48	1,0	0,77
Augusta 8	26	26	16	11	21	59	1,3	0,27
Augusta 9	23	22	9	13	9	41	1,0	0,40
Augusta 10	31	30	14	16	15	47	1,0	0,50
Control	30	28	12	16	13	43	1,2	0,46

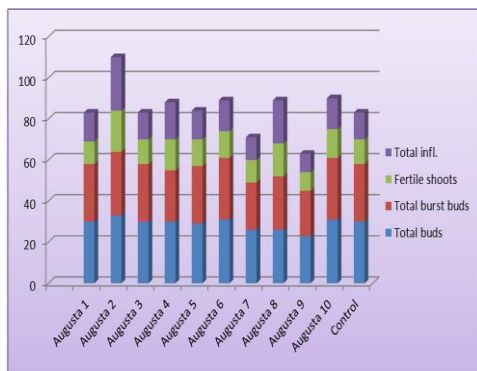


Figure 3. Fertility of fruit buds

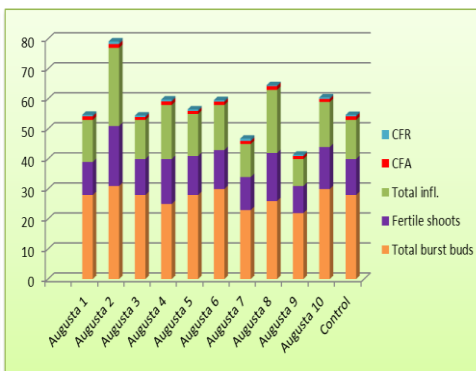


Figure 4. Absolute and relative fertility coefficients of Augusta

In the 2021-2022 wine year, agrobiological descriptors were made regarding the fertility of the clonal selections compared to the control, and the absolute and relative fertility coefficients were calculated. From figure 3 it can be seen normal values number of the inflorescences per plant, number of fertile shoots, total burst buds both within the population and in the experimental plots.

It stands out *Augusta 2* clonal selections with a fertility of 65%, Afc - 1,3, Rfc - 0,83, as well as *Augusta 8* which had a fertility of 59%, Afc - 1,3, Rfc - 0,27. *Augusta 4* clonal elites with a fertility of 48%, Afc - 1,2, Rfc - 0,58 and *Augusta 7* – fertility 48%, Afc - 1,0, Rfc - 0,77, also recorded high values (figure 4).

Table 2

Viability and fertility of fruit buds

Varians	Total number of buds	Total burst buds	Fertile shoots	Sterile shoots	Total inflorescences	Fertility %	Cfa	Cfr
Victoria 1	32	31	17	14	17	55	1,0	0,54
Victoria 2	31	29	15	14	15	52	1,0	0,51
Victoria 3	29	27	18	12	27	60	1,5	0,90
Victoria 4	21	20	16	5	21	76	1,3	1,00
Victoria 5	33	30	12	14	12	53	1,0	0,53
Victoria 6	30	28	14	14	15	50	1,0	0,53
Victoria 7	30	29	16	13	17	55	1,0	0,58
Victoria 8	31	30	16	14	17	53	1,0	0,56
Victoria 9	32	29	14	16	18	53	1,1	0,60
Victoria 10	30	26	20	6	18	77	0,9	0,69
Control	29	28	11	17	11	40	1,0	0,39

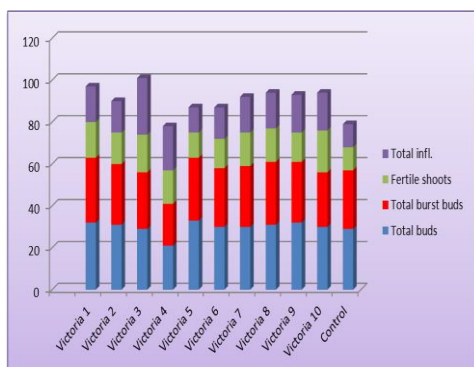
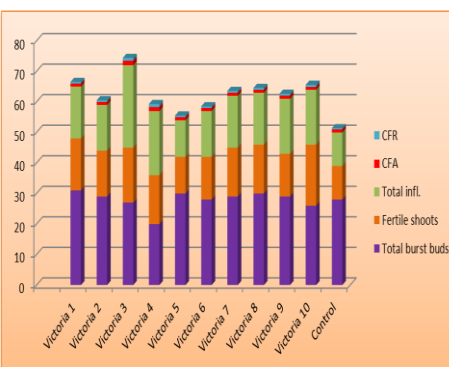


Figure 5. Fertility of fruit buds

Figure 6. Absolute and relative fertility coefficients of *Victoria*

According to specialized literature, it is known that the *Victoria* variety is characterized by a good fertility between 63-73%.

The clonal selections demonstrated a high fertility potential close to and exceeding that the control (figure 5). As can be seen in figure 8, high values are found, in terms of fertility potential, at the clonal selections *Victoria 4* and *Victoria 10* – 76%, Afc – 1,3, Rfc – 1,00 and respectively 77%, Afc – 0,9 and Rfc – 0,69. Another clonal elite that stands out is *Victoria 3* with a fertility of 60%, Afc -1,5 and Rfc – 0,90 (figure 6).

The physico-mechanical analyzes carried out on both the *Augusta* and *Victoria* clonal selections revealed the fact that the productive potential is superior to the population by the average weight of the grape, the number of berries, their weight, the weight of the pulp (table 3, 4).

Table 3

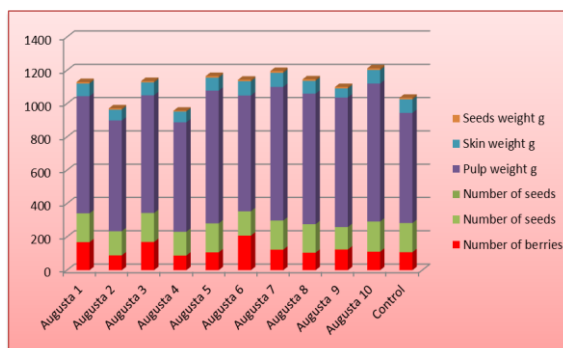
Physico-mechanical analysis of a kilogram of grapes

Varians	Number of berries	Number of seeds	Rachis weight g	Pulp weight g	Skin weight g	Seeds weight g
Augusta 1	168	173	10,90	703,66	76,33	8,78
Augusta 2	89	145	7,72	664,60	65,15	7,91
Augusta 3	169	174	10,95	707,39	76,78	8,83
Augusta 4	88	143	7,60	657,13	64,40	4,80
Augusta 5	107	174	9,22	796,80	78,33	9,50
Augusta 6	208	146	12,90	695,56	84,82	9,12
Augusta 7	123	175	8,02	802,83	84,51	10,47
Augusta 8	105	171	9,08	784,08	76,87	9,34
Augusta 9	124	135	10,01	778,32	54,25	8,42
Augusta 10	111	181	9,61	828,88	81,26	9,88
Control	108	175	7,79	661,12	81,44	9,89

Table 4

Physico-mechanical analysis of a kilogram of grapes

Varians	Number of berries	Number of seeds	Rachis weight g	Pulp weight g	Skin weight g	Seeds weight g
Victoria 1	134	145	11,10	808,01	54,12	9,90
Victoria 2	120	132	5,92	778,78	48,90	8,40
Victoria 3	107	173	9,19	798,83	76,53	9,46
Victoria 4	98	154	8,98	727,56	68,22	8,08
Victoria 5	106	172	9,18	789,94	77,79	9,67
Victoria 6	121	152	6,09	779,89	52,11	8,78
Victoria 7	92	149	8,01	690,01	68,17	8,01
Victoria 8	119	130	5,99	773,32	49,25	8,37
Victoria 9	103	168	8,89	779,11	73,34	9,61
Victoria 10	118	128	5,68	778,12	49,10	8,29
Control	101	164	8,00	689,11	48,00	8,01

Figure 7. Physico-mechanical analysis at the *Augusta* clonal selections

The physico-mechanical analyzes of one kilogram of grapes, carried out both at the clonal selections and at the *Augusta* control, presented the following values: the number of berries with values between 88 - 208, pulp weight with values between 657,13 – 828,88 g (figure 7).

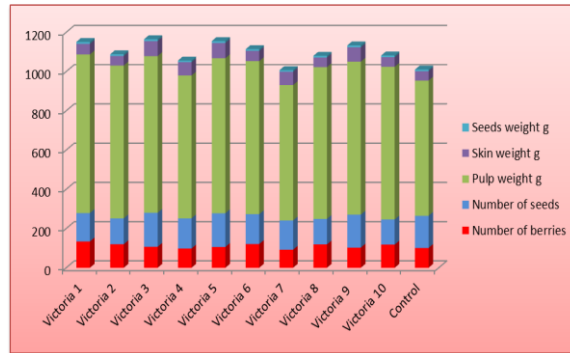


Figure 8. Physico-mechanical analysis at the *Victoria* clonal selections

The physico-mechanical analyzes of one kilogram of grapes, carried out both at the clonal selections and at the *Victoria* control, presented the following values: the number of berries with values between 92-134, pulp weight with values between 690,01 – 808,01 (figure 8).

CONCLUSIONS

Clonal selections *Augusta* 2 and 8 outperformed the other selections as well as the control in terms of fertility - 65%, Afc - 1,3, Rfc - 0,83 respectively - 59%, Afc - 1,3, Rfc - 0,27.

Clonal selections *Victoria* 4 and *Victoria* 10 outperformed the other selections as well as the control in terms of fertility - 76%, Afc- 1,3 and Rfc - 1,00 respectively 77%, Afc – 0,9 and Rfc – 0,69.

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