FRÂNCUŞĂ 14 IŞ - CLONE OF VINE FOR HIGH-QUALITY WINES, SPECIFICALLY TO THE ASSORTMENT OF COTNARI

FRÂNCUŞĂ 14 IS – CLONĂ DE VIŢĂ DE VIE PENTRU VINURI ALBE DE CALITATE SUPERIOARĂ, SPECIFICE SORTIMENTULUI DE COTNARI

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Abstract: *The improvement of the biological value of valuable vine varieties making up the traditional varieties of renowned vineyards is one of the major interests of the scientific research in the field of improving and multiplying the vine. In this respect, by applying the clone selection within the Frâncuşă variety population, the 14 Is clone was obtained and homologated in 2007, with the following features: it shows better resistance to mildew, on using anticryptogamic treatments; it makes big plain grapes, with a lower degree of millerandage and coulure, in comparison with the population; The production capacity of the clone is superior to the variety population, ensuring 40 % harvest efficiency; the sugar accumulation potential, as well as the grape juice efficiency are superior to the control variety; it is separated from the variety population through the vine homogeneity, stability of the main features and distinctive character.*

Rezumat: *Îmbunătăţirea valorii biologice a soiurilor valoroase de viţă de vie ce alcătuiesc sortimentele tradiţionale ale unor podgorii renumite, constituie una din preocupările majore ale cercetării ştiinţifice din domeniul ameliorării şi înmulţirii viţei de vie. În acest sens, prin aplicarea selecţiei clonale în cadrul populaţiei soiului Frâncuşă, în anul 2007 s-a obţinut şi omologat clona 14 Is, care prezintă următoarele însuşiri: manifestă o rezistenţă mai bună la făinare, în condiţii de aplicare a tratamentelot anticriptogamice; realizează struguri mari, cu boabe uniforme şi un grad mai mic de meiere şi mărgeluire, comparativ cu populaţia; capacitatea de producţie a clonei este superioară populaţiei soiului, asigurând un spor de recoltă de 40 %; potenţialul de acumulare a zaharurilor ca şi randamentul în must sunt superioare martorului; se detaşează de populaţia soiului prin omogenitatea butucilor, stabilitatea principalelor caractere cât şi prin distinctibilitate.*

The vine growing involves a permanent selection and improvement activity, in order to obtain varieties and clones with high production and quality features. The local varieties are a permanent source of extremely precious germoplasma for the improvement of the biological material cultivated at present.

It is the case for the Frâncuşă variety, also called Mustoasă de Moldova, Ţârţâră or Vinoasă, cultivated especially in the Moldova vineyards and representing 20 % of the variety type composition for the Cotnari wines, where it is cultivated since the XII th – XIV th centuries, as the old documents about the existence of that vineyard prove (2). Meanwhile, the soil unevenness accentuated

due to the polyclonal origin, to the fathers used to grafting and to the genetic erosion generated by the irregularities resulted after the genome replication and virous infections that were transmitted by vegetative multiplication.

Nowadays, the Frâncuşă variety shows feature mutability, becoming a population which does not achieve the potential biological performances; hence we have started its improvement through the clone selection. In our country, 50 vine variety clones have been obtained and homologated so far, the Frâncuşă variety not being the beneficiary of this improvement (1, 3, 4, 6).

MATERIAL AND METHOD

The research done so far began 15 years ago, on a plantation with Frâncuşă variety within the Viticulture and Wine-production and conservation Research-Development Station of Iaşi in the Copou viticultural centre.

After two years of observations on the source plantation, we identified the valuable biotype of the population, by choosing 18 clone elites, with ampelographic feature evenness, reduced of millerandage and coulur percent, perfect phytosanitary condition and superior concentration of sugar accumulation, aiming at obtaining a quality clone (fig.1).

Fig. 1 – Aspects about the 14 Is Frâncuşă clone

The stable clone material multiplied through grafting and was checked in the vine system, in parallel with that followed on the source plantation. The grafted vines helped obtaining a comparative field, including 22 vines for every clone, where observations, analyses and tests were made about the vegetation condition, the grape production and quality of wines, resistance to cryptogamic diseases and to the stressful environment. After six years of observations and analyses, 4 perspective

elites (clones) stood out, which multiplied through grafting, resulting in 100 vines of each clone, which were used at creating a contest field (checking), organized by five repetitions of every alternative (clone). The control varieties used were the clone average and the variety population, according to the experimental technique norms and the improvement systems through clone selection. After other 3 years of fruit-bearing on the contest plantation and in the comparative field, a clone elite was evidenced, codified under no.14, which was registered in 2004 for testing for homologation and whose results are the object of the present work.

During 2004- 2006, which was the final stage of the official system of the vine clone selection adopted on the national and international level, the agrobiological and technological observations continued according to the I.S.T.I.S. requirements. The distinctive clone features were described, in comparison with the population of the Frâncuşă variety, throughout the whole vegetation period, following the descriptive elements adopted by UPOV. The phytosanitary and conservative clone selection were ensured, together with the serological testing of the main existing viruses. The grapes were submitted to the process of wine-production and conservation and the wines resulted from the homologation clone were fully analyzed in comparison with the control varieties.

RESULTS AND DISCUSSIONS

The weather in the Iaşi vineyard, namely the Copou viticultural centre, during the testing period of the Frâncuşă variety was close to the normal climatic conditions of these environment factors, being favorable for the grape vegetation and ripening period. The winter of 2004 was mild, with good minimum temperatures for the vine, while during 2006 there were sudden temperature decreases down to -25°C in the air, which mostly affected the buds.

The annual rainfall was greater and better distributed in 2004, while the daily average temperatures in the second half of 2006 favoured the beginning of the grape ripening and the grape technological ripening (table 1).

Table 1

Phenological spectrum

Describing elements	14 Is clone		The elite average		The population variety	
	2004	2006	2004	2006	2004	2006
Disbudding	28 IV	29 IV	28 IV	29 IV	28 IV	29 IV
Flowering	11 VI	14 VI	11 VI	14 VI	12 VI	14 VI
The grape ripening	20 VIII	5 VIII	19 VIII	5 VIII	19 VIII	5 VIII
Technological maturity	14 X	26 IX	14 X	26 IX	14 X	26 IX

The phonological spectrum started with disbudding at the end of April during the two years of observations, without any significant differences between the clones, the elite average and the population variety, just as the flowering phenostage, between 11 – 14 June. The grape ripening and technological maturation were almost two weeks earlier in 2006. From the point of view of the phonological spectrum, the Frâncuşă 14 clone is perfectly integrated into the variety features, achieving the vegetation period within 168 – 170 days.

The fertility and productivity elements of the clone evaluated by the

number of offsprings on vines and the percent of fertile offsprings are close to the Frâncuşă variety elite average and population (table 2). The same aspect is revealed as well by the average number of existing flowerings on the vine. There are obvious differences between the superior values of the grape average weight, which are favourable to the clone, in comparison with those of the control varieties. This aspect is corroborated by the smaller values of the millerandage and coulur grape percent noticed at the Frâncuşă 14 clone (table 2).

As for the description of certain physiological features, we noticed that, through the clone selection, we didn't manage to improve the frost resistance of the Frâncuşă 14 Is clone, but we improved the decrease in the percent of the millerandage and coulur grapes (table 3).

The behaviour towards the attack of cryptogamic diseases revealed a better resistance to midlew during the preventive treatments. The tests done by the ELISA procedure confirmed that this clone is free of virous diseases.

Table 2

Fertility and productivity elements

Describing elements	14 Is clone			The elite average			The population variety		
	2004	2006	X	2004	2006	X	2004	2006	X
Number of offshoots / vine	54,2	41,0	47,6	50,6	40,8	45,7	52,8	40,4	46,6
% fertile offshoots / vine	54,9	50,2	52,9	67,5	48,5	59,5	66,8	47,0	58,3
No. of inflorescences / vine	41,6	23,2	32,4	47,4	20,2	33,8	38,4	19,6	29,0
Average weight of the grape, g	230,2	199,4	214,8	182,2	183,6	182,9	178,2	176,2	177,2

Table 3

Certain physiological features

Describing elements	14 Is clone			The elite average			The population variety		
	2004	2006	X	2004	2006	X	2004	2006	X
Frost behaviour, % bud demage	16	48	32	16	48	32	16	48	32
Millerandage, %	0	0	0	0	0	0	7	5	6
Coulure, %	12	7	8	14	10	12	31	33	32

The grape production made on the vine and calculated on every hectar shows its stability features in the case of the 14 clone, which showed small variations under the influence of the annual environment factors, in comparison with the elite average and the variety population. This aspect was obvious throughout the whole experimental cycle of multiannual observations. The average grape production made by the 14 clone of 13.4 tons/ha is 41 % greater than the population variety and was appreciated and submitted to homologation due to its qualitative potential, even though the elite average registered greater crops (table 4).

The superior results of the average weight of 100 grapes and the sugar content of the grape juice which is good only for the Frâncuşă 14 clone provide reasons for the quality of the grape harvesting. We must underline that the Frâncuşă variety, which is cultivated within the vine ecosystem of Copou – Iaşi,

does not meet the specific qualitative parameters for the Cotnari vineyard, where it is possible to overripen and where the new clone may reach superior quality performances (5).

Tabelul 4

The production of grapes and its quality for the clone elite Frâncuşă14 compared with the control variety

Years	Variety code	Production		%	Average weight of 100 grapes, g	Total acidity, g/L H_2SO_4	Grape juice efficiency %	Sugars, g/L	%
		kg/vine	tons/ha						
2004	14	4,12	15,6	133	265	5,2	72	209	143
	X elite	5,32	20,15	172	197	5,6	70	146	100
	population variety	3,08	11,66	100	152	5,6	68	146	100
2005	14	3,00	11,36	153	215	7,6	71	187,6	112
	X elite	2,84	10,76	145	194	7,8	71	172,6	103
	population variety	1,95	7,38	100	190	7,8	68	166,8	100
$\overline{X}$	14	3,56	13,48*	141	240	6,4	71,5	198,3	123
	X elite	4,16	15,75	161	196	6,7	70,5	159,3	102
	population variety	2,52	9,54	100	171	6,7	68,0	156,4	100

DL compared with the population:
5 %= 1,27;
1 %= 6,36;
0,1 %= 63,66;

Tabelul 5

Physical-chemical features of the wines coming from the wine-production and conservation of the 14 clone elite grapes (Frâncuşă) compared with the control variety (the variety population)

Physical-chemical features	Frâncuşă cl 14 Iş		Frâncuşă, the population variety	
	2004	2006	2004	2006
Alcohol, vol. %	11,8	11,0	8,5	9,8
Total acidity g/LH_2SO_4	5,2	5,6	5,6	7,0
Volatile acidity g/LCH_3CCOH_4	0,21	0,23	0,28	0,34
Free SO_2, mg/L	24	25	27	28
Total SO_2, mg/L	135	137	142	145
Non-reducing extract, g/L	24	26	24	25

The sugar content of the grape juice made in Iaşi during the testing period of the Frâncuşă 14 clone proves its potential to obtain superior quality wines at the vineyard as well.

The results of the wine analysis obtained from the Frâncuşă 14 clone made in Iaşi and described in table 5 confirm this issue.

Created as a pure variety on the full grape maturity, the Frâncuşă 14 clone created soil-featured wines, fruitful wines, highly alcoholic wines superior to the population variety, less acid, extract stronger and richer that may be included in the category of the controlled source name wines. It participates, together with the other varieties, to make the “Cotnari”-like wines

CONCLUSIONS

1.The results of the clone selection of the local variety, Frâncuşă, destined for the production of superior white wines, were materialized by homologating the Frâncuşă 14 vine clone of Iaşi, through the certification no. 68043 of 31 October 2007 by the Public Institute for the testing and registration of varieties and the recommendation for cultivating in the areas favourable for the vine growing.

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