JOURNAL OF AGRICULTURE AND PLANT SCIENCES, JAPS, Vol 18, No. 1, 2020

Manuscript received 04.05.2020
Accepted: 28.06.2020

In print: ISSN 2545-4447
On line: ISSN 2545-4455
doi: https://doi.org/10.46763/JAPS2010041r
Original scientific paper

INVESTIGATION OF THE CORRELATIONS BETWEEN QUANTITATIVE TRAITS WHICH DETERMINE YIELD IN THE VINE CULTIVAR BOLGAR AND THE HYBRID COMBINATION BOLGAR X RUSSALKA 1

Venelin Roychev[1*], Dushko Nedelkovski[2], Klime Beleski[2]

[1]*Agricultural University – Plovdiv, R. Bulgaria*
[2]*Ss Cyril and Methodius University, Institute of Agriculture – Skopje, Republic of North Macedonia*
[*]*Corresponding author: roytchev@yahoo.com*

Abstract

The correlations between quantitative traits, which determine yield in the vine cultivar Bolgar and F_1 progeny of the hybrid combination Bolgar x Russalka 1 have been investigated through Path analysis. It has been found that there are no highly significant traits for the formation of yield from this cultivar, for which the correlation coefficients, direct and total indirect influences have positive values. Positive correlations have been reported between the two parent cultivars and F1 progeny for the traits: shoot and fruiting shoot fertility coefficient, cluster width, total number of shoots, fruiting shoots and clusters. All studied fertility coefficients in the cultivar Bolgar exert positive direct influences, determined by moderate correlations, on the seedlings from F1 progeny. The correlations of the other traits and the influence of separate parent cultivars have positive or negative values, which can be used in the selection of valuable elite forms.

Key words: *quantitative traits, yield; seeded and seedless vine cultivar; F1 progeny; correlations; direct and indirect influences; Path analysis*

INTRODUCTION

It is known that, by means of Path analysis it is possible to determine the degree, to which the variability of a certain quantitative trait influences the change of a single trait or a group of other traits. The total correlation and the relative participation of each trait in yield formation are established through this method, and it allows their comparing with results from other experiments. The advantages of Path analysis combined with the analytical potential of the production function are a model, which can be efficiently applied in the experimental procedures in viticulture (Mokreva 2004, 2007). The type of the effect from the influence of a certain significant agrobiological factor, combined with the remaining ones, on the phenotypic manifestation of the variable value – the cumulative trait (yield), is also of interest. Their application is especially important and valuable in the complicated development of new table seeded and seedless vine cultivars (Smirnov 1977; Golodriga et al., 1985; Pospisilova, Palenik 1988; Valchev 1990; Troshin 1990, 1997). The purpose of the current investigation is to determine the degree of correlations between quantitative traits and their relative participation in yield formation for the vine cultivar Bolgar and F_1 progeny of the hybrid combination Bolgar x Russalka 1.

MATERIAL AND METHODS

During seven consecutive years, in 30 plants from F_1 progeny of the hybrid combination Bolgar (P_1 – seeded) x Russalka 1 (P_2 – seedless), 21 quantitative traits were determined, related to the phenology, fertility, quality and grape yield (Bulgarian Ampelography, 1990; Roychev 2012). The experimental results were processed by means of Path analysis (Rokitskii 1973; Lidanski 1988). The studied traits were conditionally divided into six groups. The direct and indirect

influences of the indicated traits of parent cultivars on yield formation in seedlings and the degree of correlations between them were analyzed. The presented results are a part of a larger-scale research related to the application of Path analysis in selection for the obtaining of new seeded and seedless vine cultivars.

RESULTS AND DISCUSSION

In the cultivar Bolgar (P_1) few traits from different groups manifest high, significant and moderate correlations with yield (Table 1). Most often, the high direct positive effect is eliminated by almost the same in size total indirect influence, deriving from the interdependence of the other traits or vice versa. This is typical not only for the traits with higher correlation coefficients (0,625) – total number of clusters, (0,530) - total number of fruiting shoots, (0,476) - total number of shoots, (0,357) – berry length, (0,383) – berry width, (0,357) – shoot fertility coefficient, (0,288) – main shoot fertility coefficient, but also for all remaining ones. There are no traits significant for the yield, in which the correlation coefficients, direct and total indirect influences have positive values, which means that the yield in this cultivar depends on numerous different factors and their interaction.

Table 1.

The traits which exert positive influence on yield formation in the cultivar Bolgar (P1) are in the first, second, third and sixth group, with total relative participation 95,6% (Table 2). The most significant presence belongs to all traits connected with the actual fertility of vines (59,2%). Out of them, the larger share belongs to total number of clusters (24,8%) and fruiting shoots (17,9%), as well as the three fertility coefficients – totally (16,5%). Comparatively more traits from a larger number of groups participate in yield formation for this cultivar.

Table 2. Relative participation of traits in the formation of grape yield from the seeded cultivar Bolgar (P_1).

Groups	№	Total yield variation	100,0
		Total relative participation of the most important traits 95,6%, from which:	%
I	x_1	Shoot fertility coefficient	8.1
	x_2	Main shoot fertility coefficient	5.3
	x_3	Fruiting shoot fertility coefficient	3.1
II	x_6	Cluster length (cm)	2.5
III	x_9	Berry length (mm)	8.1
	x_{10}	Berry width (mm)	9.3
VI	x_{18}	Total number of buds	2.1
	x_{19}	Total number of shoots	14.4
	x_{20}	Total number of fruiting shoots	17.9
	x_{21}	Total number of clusters	24.8
Other traits			4.4

Table 1. Direct and indirect influences of the studied traits on grape yield per vine for Bolgar (P_1).

Groups	Traits	[b]	Direct and indirect influences																				Total indirect influences	r
			x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14	x15	x16	x17	x18	x19	x20		
I	Shoot fertility coefficient	x_1	-49,488	24,798	-20,283	0,693	-0,382	-0,100	-2,845	5,532	-3,574	8,940	-4,154	6,118	-1,154	-4,639	0,158	0,769	1,587	7,821	-1,361	-10,225	38,267	48,943	0,357
	Main shoot fertility coefficient	x_2	-27,568	38,618	-40,611	-1,850	-0,374	-0,365	-6,662	5,529	-7,485	5,660	7,668	-2,858	9,195	-3,388	-0,734	-1,232	-2,287	6,046	-0,467	-1,662	29,235	-35,230	0,288
	Fruiting shoot fertility coefficient	x_3	-14,573	26,254	-48,488	0,298	-0,191	-0,328	8,560	-0,295	-10,944	8,415	12,044	-18,851	6,928	12,254	-0,228	1,729	-1,713	6,214	8,686	5,108	17,041	56,789	0,221
II	Bilberry-shape berries (%)	x_4	4,371	5,956	2,613	-8,486	8,863	0,141	5,548	0,137	3,747	-2,116	-5,571	1,832	14,201	-14,780	-1,322	1,953	-0,957	-1,588	1,421	4,726	-12,549	6,365	-0,078
	Average cluster weight (g)	x_5	5,395	-4,747	3,755	-1,509	2,877	0,257	3,433	1,444	-4,135	3,985	2,879	1,532	9,594	-8,963	-0,791	1,034	-5,361	-10,847	13,595	9,325	-28,512	-2,712	0,165
	Cluster length (cm)	x_6	-3,427	18,597	-15,618	0,767	-0,721	-1,197	-6,804	5,418	-3,422	-7,783	16,748	8,327	7,319	1,494	-0,213	-4,595	1,958	1,575	-4,879	-3,688	15,252	1,384	0,197
	Cluster width (cm)	x_7	-6,348	1,328	1,738	1,598	-0,543	-0,448	-18,782	-0,378	4,018	-14,151	9,071	-6,963	17,443	13,442	-0,435	-5,851	4,188	-6,813	-0,852	-7,829	19,514	18,354	0,152
III	Average weight of 100 berries (g)	x_8	6,398	-6,163	-8,475	0,825	-0,118	0,183	-8,195	-36,188	10,852	-12,852	-7,125	-11,375	10,923	4,947	-0,868	13,344	-0,089	8,254	5,531	4,368	-18,287	34,595	-0,137
	Berry length (cm)	x_9	-5,632	18,612	-24,002	0,936	0,462	-0,158	2,838	13,752	-35,787	30,738	14,391	6,852	-19,278	7,329	1,556	-6,863	-6,878	9,189	-5,418	2,091	6,225	26,114	0,357
	Berry width (cm)	x_{10}	-8,488	4,785	-11,005	0,315	0,264	0,214	5,960	9,836	-18,330	48,182	-16,542	13,849	-30,024	4,918	2,288	-4,376	-1,877	7,205	-6,158	-3,974	17,689	-42,889	0,383
	Berry shape index	x_{11}	4,895	6,795	-16,527	0,886	0,291	-0,483	-4,888	6,089	-9,804	-17,355	41,147	-6,738	14,701	3,380	-0,958	-3,168	-6,447	2,320	2,995	7,768	-14,568	-41,218	-0,061
IV	Budding-flowering (days)	x_{12}	6,859	2,547	-13,854	0,152	-0,108	0,008	-3,891	-9,752	3,829	-13,753	8,768	-48,882	9,758	31,134	-1,148	5,400	1,153	8,244	-4,683	0,118	7,543	48,844	-0,138
	Flowering-softening (days)	x_{13}	0,542	6,757	-7,870	-1,839	0,555	-0,175	-6,385	-7,722	9,988	-35,885	12,178	-6,048	48,486	-11,225	-3,167	3,223	-3,453	-15,705	8,571	5,641	-11,157	-49,885	-0,158
	Softening-fruit maturity (days)	x_{14}	-4,057	2,886	14,915	-2,849	0,555	0,038	5,269	3,745	4,057	-4,577	-2,938	27,494	12,028	-48,488	-1,368	-8,632	-3,154	1,416	5,385	1,057	-18,858	45,489	0,081
	Budding-fruit maturity (days)	x_{15}	1,795	7,514	-3,628	-2,385	0,638	-0,071	-2,218	-8,478	11,295	-27,589	10,965	-13,089	44,116	-17,795	-3,687	5,054	-3,441	-8,153	5,717	4,141	-6,928	3,361	-0,206
V	Sugars (%)	x_{16}	-1,788	-2,538	-5,511	-0,789	0,168	0,308	5,801	-26,455	9,584	-18,886	-7,360	-12,487	9,037	1,854	-1,017	17,722	-2,688	5,046	3,612	5,017	-11,712	-17,587	-0,225
	Acids (g/dm³)	x_{17}	-4,157	-5,445	6,308	0,405	-1,885	-0,154	-4,862	0,285	11,534	-5,286	-17,308	-3,188	-11,186	5,652	0,888	-3,812	16,941	1,822	-3,488	-9,714	22,234	-15,258	0,091
VI	Tufet number of buds	x_{18}	-10,272	7,145	-11,359	0,414	-1,818	-0,151	4,011	-0,289	-7,593	18,870	3,091	-0,323	-25,257	-2,125	0,542	2,894	0,585	38,982	-15,802	-6,914	23,734	-38,719	0,183
	Tufet number of shoots	x_{19}	-1,782	8,551	1,257	0,295	-1,262	-0,187	-8,580	6,268	-4,495	11,423	-3,978	-6,085	-13,738	8,077	0,858	-2,865	1,683	14,973	-31,880	-16,094	41,784	31,479	0,476
	Tufet number of fruiting shoots	x_{20}	-18,342	2,678	12,888	1,337	-1,188	-0,192	-6,264	6,748	2,368	7,549	-14,067	8,214	-12,329	2,158	0,858	-3,911	6,555	5,397	-21,946	-22,728	54,157	23,265	0,538
	Tufet number of shoulders	x_{21}	-24,758	17,845	-15,369	1,289	-1,318	-0,288	-5,868	5,771	-2,550	12,158	-9,836	-4,535	-8,884	7,897	0,508	-3,314	5,445	11,710	-28,543	-19,678	62,882	-62,887	0,625

The structure of correlations between separate parents and F_1 progeny by groups of traits is different (Table 3). In the first group, the correlations are positive at shoot fertility coefficient (0,176)-P_1, (0,235)-P_2 and fruiting shoot fertility coefficient (0,165) -P_1, (0,382) -P_2; in the second group – cluster width (0,138)-P_1, (0,608)-P_2, in the sixth group – total number of shoots (0,305)-P_1, (0,009)-P_2, total number of fruiting shoots (0,155)-P_1, (0,057)-P_2 and total number of clusters (0,291)-P_1, (0,027) -P_2. In all traits in the fourth group – phenophases and periods, fifth group – chemical composition, and sixth group – actual fertility of vine, the positive correlations prevail of the cultivar Bolgar (P_1) with F_1 progeny, and in the first group - of the cultivar Russalka 1 (P_2). Except for berry shape index for Bolgar (P_1), both parent cultivars have negative correlations for the berry traits. We should also point out the higher positive correlations of Bolgar (P_1) with F_1 progeny regarding the traits total number of buds (0,385), acids (0,578), budding-flowering (0,399) and cluster length (0,525), and of Russalka 1 (P_2) – main shoot fertility coefficient (0,313), millerandage berries (0,358) and average cluster weight (0,278).

Table 3. Correlation coefficients between the traits of the studied vine cultivars Bolgar (P_1), Russalka 1 (P_2) and the plants from the hybrid combination - F_1 progeny.

Groups	№	Traits	Cultivars		F_1	P_1	P_2
I	1	Shoot fertility coefficient	F_1 progeny	F_1	1	0,176	0,235
			Bolgar	P_1		1	-0,133
			Ryssalka 1	P_2			1
	2	Main shoot fertility coefficient	F_1 progeny	F_1	1	-0,098	0,313
			Bolgar	P_1		1	0,124
			Ryssalka 1	P_2			1
	3	Fruiting shoot fertility coefficient	F_1 progeny	F_1	1	0,165	0,382
			Bolgar	P_1		1	-0,236
			Ryssalka 1	P_2			1
II	4	Millerandage berries (%)	F_1 progeny	F_1	1	-0,042	0,358
			Bolgar	P_1		1	0,218
			Ryssalka 1	P_2			1
	5	Average cluster weight (g)	F_1 progeny	F_1	1	-0,112	0,278
			Bolgar	P_1		1	0,135
			Ryssalka 1	P_2			1
	6	Cluster length (cm)	F_1 progeny	F_1	1	0,525	-0,350
			Bolgar	P_1		1	-0,270
			Ryssalka 1	P_2			1
	7	Cluster width (cm)	F_1 progeny	F_1	1	0,138	0,608
			Bolgar	P_1		1	0,117
			Ryssalka 1	P_2			1
III	8	Average weight of 100 berries (g)	F_1 progeny	F_1	1	-0,294	-0,190
			Bolgar	P_1		1	-0,044
			Ryssalka 1	P_2			1
	9	Berry length (mm)	F_1 progeny	F_1	1	-0,048	-0,251
			Bolgar	P_1		1	0,174
			Ryssalka 1	P_2			1
	10	Berry width (mm)	F_1 progeny	F_1	1	-0,016	-0,075
			Bolgar	P_1		1	-0,327
			Ryssalka 1	P_2			1
	11	Berry shape index	F_1 progeny	F_1	1	0,035	-0,294
			Bolgar	P_1		1	0,295
			Ryssalka 1	P_2			1

IV	12	Budding-flowering (days)	F_1 progeny	F_1	1	0.399	-0.106
			Bolgar	P_1		1	-0.220
			Ryssalka 1	P_2			1
	13	Flowering-softening (days)	F_1 progeny	F_1	1	0.088	-0.042
			Bolgar	P_1		1	0.317
			Ryssalka 1	P_2			1
	14	Softening–technological maturity (days)	F_1 progeny	F_1	1	0.089	-0.440
			Bolgar	P_1		1	0.255
			Ryssalka 1	P_2			1
	15	Budding-technological maturity (days)	F_1 progeny	F_1	1	0.135	-0.228
			Bolgar	P_1		1	0.305
			Ryssalka 1	P_2			1
V	16	Sugars (%)	F_1 progeny	F_1	1	0.169	-0.208
			Bolgar	P_1		1	0.186
			Ryssalka 1	P_2			1
	17	Acids (g/dm^3)	F_1 progeny	F_1	1	0.578	-0.019
			Bolgar	P_1		1	0.159
			Ryssalka 1	P_2			1
VI	18	Total number of buds	F_1 progeny	F_1	1	0.385	-0.096
			Bolgar	P_1		1	0.099
			Ryssalka 1	P_2			1
	19	Total number of shoots	F_1 progeny	F_1	1	0.305	0.009
			Bolgar	P_1		1	0.260
			Ryssalka 1	P_2			1
	20	Total number of fruiting shoots	F_1 progeny	F_1	1	0.155	0.057
			Bolgar	P_1		1	0.065
			Ryssalka 1	P_2			1
	21	Total number of clusters	F_1 progeny	F_1	1	0.291	0.027
			Bolgar	P_1		1	0.053
			Ryssalka 1	P_2			1

All fertility coefficients in the cultivar Bolgar (P_1) exert positive direct influence determined by a moderate correlation, on the seedlings from F_1 progeny – shoot fertility coefficient (0,267; 0,235), main shoot fertility coefficient (0,328; 0,313), fruiting shoot fertility coefficient (0,433; 0,382) (Table 4). Both parent cultivars have direct positive influence with a significant correlation coefficient on the trait millerandage berries. The direct influences of all traits in the sixth group of the cultivar Russalka 1 (P_2) are positive, and of Bolgar (P_1) – only in total number of fruiting shoots and clusters. Positive influences and correlations in the two cultivars were reported for cluster width, and in average cluster weight only their direct effects are positive. In sugars (0,227), acids (0,255), the phenological traits (except for budding-flowering), berry shape index (0,306) and berry length (0,162), the direct influence of Russalka 1 (P_2) is positive, and of Bolgar (P_1) – negative. In cluster length all influences and correlations are negative in both parent cultivars.

Table 4. Direct and indirect influences of the studied parent vine cultivars Bolgar (P_1) and Russalka 1 (P_2) on the plants from the hybrid combination - F_1 progeny.

Groups	№	Traits	Cultivars		Direct and indirect influences		r
I	1	Shoot fertility coefficient	Bolgar	P_1	*0,267*	-0,032	0,235
			Ryssalka 1	P_2	0,047	*-0,180*	-0,133
	2	Main shoot fertility coefficient	Bolgar	P_1	*0,328*	-0,015	0,313
			Ryssalka 1	P_2	-0,032	*0,156*	0,124
	3	Fruiting shoot fertility coefficient	Bolgar	P_1	*0,433*	-0,051	0,382
			Ryssalka 1	P_2	0,071	*-0,307*	-0,236
II	4	Millerandage berries (%)	Bolgar	P_1	*0,368*	-0,010	0,358
			Ryssalka 1	P_2	-0,015	*0,233*	0,218
	5	Average cluster weight (g)	Bolgar	P_1	*0,297*	-0,019	0,278
			Ryssalka 1	P_2	-0,033	*0,168*	0,135
	6	Cluster length (cm)	Bolgar	P_1	*-0,288*	-0,062	-0,350
			Ryssalka 1	P_2	-0,151	*-0,119*	-0,270
	7	Cluster width (cm)	Bolgar	P_1	*0,603*	0,005	0,608
			Ryssalka 1	P_2	0,083	*0,034*	0,117
III	8	Average weight of 100 berries (g)	Bolgar	P_1	*-0,222*	0,032	-0,190
			Ryssalka 1	P_2	0,065	*-0,109*	-0,044
	9	Berry length (mm)	Bolgar	P_1	*-0,243*	-0,008	-0,251
			Ryssalka 1	P_2	0,012	*0,162*	0,174
	10	Berry width (mm)	Bolgar	P_1	*-0,080*	0,005	-0,075
			Ryssalka 1	P_2	0,001	*-0,328*	-0,327
	11	Berry shape index	Bolgar	P_1	*-0,305*	0,011	-0,294
			Ryssalka 1	P_2	-0,011	*0,306*	0,295
IV	12	Budding-flowering (days)	Bolgar	P_1	*-0,021*	-0,085	-0,106
			Ryssalka 1	P_2	-0,008	*-0,212*	-0,220
	13	Flowering-softening (days)	Bolgar	P_1	*-0,070*	0,028	-0,042
			Ryssalka 1	P_2	-0,006	*0,323*	0,317
	14	Softening–technological maturity (days))	Bolgar	P_1	*-0,467*	0,027	-0,440
			Ryssalka 1	P_2	-0,042	*0,297*	0,255
	15	Budding-technological maturity (days)	Bolgar	P_1	*-0,274*	0,046	-0,228
			Ryssalka 1	P_2	-0,037	*0,342*	0,305
V	16	Sugars (%)	Bolgar	P_1	*-0,246*	0,038	-0,208
			Ryssalka 1	P_2	-0,041	*0,227*	0,186
	17	Acids (g/dm^3)	Bolgar	P_1	*-0,166*	0,147	-0,019
			Ryssalka 1	P_2	-0,096	*0,255*	0,159
VI	18	Total number of shoots	Bolgar	P_1	*-0,158*	0,062	-0,096
			Ryssalka 1	P_2	-0,061	*0,160*	0,099
	19	Total number of shoots	Bolgar	P_1	*-0,078*	0,087	0,009
			Ryssalka 1	P_2	-0,024	*0,284*	0,260
	20	Total number of fruiting shoots	Bolgar	P_1	*0,048*	0,009	0,057
			Ryssalka 1	P_2	0,007	*0,058*	0,065
	21	Total number of clusters	Bolgar	P_1	*0,013*	0,014	0,027
			Ryssalka 1	P_2	0,004	*0,049*	0,053

CONCLUDING REMARKS

There are no highly significant traits for yield formation from the cultivar Bolgar, in which the correlation coefficients, direct and total indirect influences have positive values. With a total relative participation 95,6%, the productivity of this cultivar is determined by traits, which are predominantly connected with the actual fertility of vines – total number of clusters (24,8%) and fruiting shoots (17,9%), fertility coefficients – totally (16,5%).

Positive correlations have been established between the two parent cultivars and F1 progeny in the traits shoot and fruiting shoot fertility coefficient, cluster width, total number of shoots, fruiting shoots and clusters. For Bolgar they are higher regarding total number of buds, acids, budding-flowering and cluster length, and for Russalka 1 – main shoot fertility coefficient, millerandage berries and average cluster weight.

Positive direct influence determined by a moderate correlation, on the seedlings from F_1 progeny, is exerted by all studied fertility coefficients in the cultivar Bolgar. The correlations in the other traits and the influence of the separate parent cultivars have positive or negative value, which can be used in the selection of valuable elite forms.

REFERENCES

Bulgarian Ampelography (1990). General ampelography, Bulgarian Academy of Sciences. Agricultural Academy. Institute of Viticulture and Wine Production – Pleven. Sofia.

Golodriga, P.Y., Troshin, L.P., Frolova, L.I. (1985). Inheritance of the trait seedlessness in hybrid progeny in vine V. vinifera L.. Cytology and Genetics, 19, 372-376.

Lidanski, T, (1988). Statistical methods in biology and agriculture. Zemizdat, Sofia, 375.

Mokreva, T. (2004). Production function in analysis of yield structure in vine. Horticultural Sciences, 42, 130-137.

Mokreva, T. (2007). Comparative characteristics of statistical criteria and algorithms for evaluation of experimental data from viticulture. PhD Dissertation, Plovdiv, 145.

Pospisilova, D., Palenik, V. (1988). Heredity of seedlessness in grapes. Genetika a Slechteni, 24 /LXI/, 4, 325-332.

Rokitskii, P.F. (1973). Biological statistics. Third edition. Minsk, Higher Institute, 328.

Roychev, V. (2012). Ampelography. Academic Press of the Agricultural University – Plovdiv, 574.

Smirnov, K.V. (1977). Vine selection for seedlessness. Moscow. Collection of scientific works, TSHA, 231, 90-97.

Troshin, L.P. (1990). Evaluation and choice of selection material in vine. Yalta, 136.

Troshin, L.P. (1997). Analysis of hereditary information in vine. Grape and Wine of Russia, 1, 17-21.

Valchev, V. (1990). Intraspecific and interspecific hybridization in vine. Habilitation dissertation, Pleven, 272.

ИСТРАЖУВАЊЕ НА КОРЕЛАЦИЈАТА ПОМЕЃУ КВАНТИТАТИВНИТЕ КАРАКТЕРИСТИКИ КОИШТО ГО ОДРЕДУВААТ ПРИНОСОТ КАЈ СОРТАТА БЛГАР И ХИБРИДОТ БЛГАР Х РУСАЛКА 1

Венелин Рojчев[1*], Душко Неделковски[2], Климе Белески[2]
[1]Земјоделски универзитет- Пловдив, Р. Бугарија
[2]Универзитет Св.Кирил и Методиј – Скопје, Земјоделски институт- Скопје, Република Северна Македонија
**Контакт автор: roytchev@yahoo.com*

Резиме

Корелациите помеѓу квантитативните карактеристики, коишто го одредуваат приносот кај сортата *блгар* и $Ф_1$ потомок на хибридна комбинација блгар х русалка 1, беа испитани преку Path анализа. Откриено е дека нема карактеристики коишто се многу значајни за формирање на принос од оваа сорта за кои коефициентите на корелација, директните и вкупните индиректни влијанија имаат позитивни вредности. Позитивни корелации се утврдени помеѓу двете родителски сорти и F_1 потомството за својствата: развиени и родни ластари, коефициент на родност, ширина на гроздот, вкупен број на ластари, родни ластари и гроздови. Сите анализирани коефициенти на родност кај сортата блгар имаат позитивни директни влијанија, утврдени со умерени корелации, врз семениците од F_1 потомство. Корелациите на другите особини и влијанието на одделните родителски сорти имаат позитивни или негативни вредности кои можат да се користат при изборот на вредни елитни форми.

Клучни зборови: *квантитативни карактеристики, родност, семена и бессемена сорта, F1, потомок*