

SOME CHARACTERISTICS OF THE PROSPECTIVE HYBRID OF THE VINE

**IVANA RADOJEVIĆ¹, MILOŠ RISTIĆ¹, MLAĐAN GARIĆ², TATJANA JOVANOVIĆ
CVETKOVIĆ³, ZORICA RANKOVIĆ-VASIĆ⁴, DRAGAN NIKOLIĆ⁴, ZORAN PRŽIĆ⁴,
IVANA MOŠIĆ⁵**

¹Center for Viticulture and Enology, Serbia

²Faculty of Agriculture, University of Pristina, Lesak

³Faculty of Agriculture, University of Banja Luka, Republic of Srpska (BIH)

⁴Faculty of Agriculture, University of Belgrade, Serbia

⁵College of Agriculture and Food, Prokuplje, Serbia

Keywords: *Vitis vinifera*, hybrid, crossing, yield, quality

ABSTRACT

Obtaining new high-productive and high-quality varieties of different purposes and time of maturation is the basic goal of grape cultivation. In the world, it is permanently working on the creation of new varieties and vineyards in many breeding programs. Various wine cultivation methods have created a number of new varieties that have contributed to increasing yields multiplying and maintaining grapes quality or improving, as well as increasing resistance to adverse environmental factors. At the experimental estate of the Center for Viticulture and Enology in Nis for many years, it has been working on the creation of new varieties of vines through intraspecies hybridization with the aim of combining the desirable properties of selected parental partners in the genotype of one of their descendants. This paper presents the three-year results (2007-2009) of important economic and technological characteristics in the perspective hybrid intended for the production of wine. On the basis of the obtained results, the tested hybrid meets the set goals of the selection.

INTRODUCTION

Vines *vinifera* L. is today one of the most important plant species around the world. Grapes are now mostly used for wine production, fresh or dry.

Vineyard cultivation is a process that is constantly flowing. So far, many goals have been achieved, a great number of methods have been developed and enviable results have been achieved. The largest number of new varieties and substrates was created by the method of planned hybridization, and significantly smaller number of methods of clonal selection and induced mutations. And new biotechnology methods give noticeable results. For future generations, with the faster development of science and new results in this field, they contribute to even greater development of viticulture.

High and high quality grape production depends primarily on the result of breeding, ie, Potential cultivated varieties. The variety in combination with the base is the basis of modern viticulture. Almost all the varieties that are present today in viticulture production have been created by breeding. The genes that contain the variety affect the yield, quality, resistance to disease and pests, the relationship to the outside environment and all agrotechnical measures applied from planting to harvest, and to post harvest processes. Therefore, the improvement of the genetic potential of cultivated varieties, with the increasing progress of agro-technology, is the basis of safety in the population of the population

In the world, these results are remarkable, but in our country many institutions and selectors in them have created and practiced a lot of valuable new table and wine grape varieties (Avramov, 1997, Cindric, 1986,2000, Tarailo, 1997, 1998). The results in our

country in terms of the creation of new stones and wine varieties were mostly achieved using the methods of full cross-border and intermodal hybridization. This is also the method by which the vineyards are mostly cultivated in order to increase and improve the assortment.

In every wine growing region of the world, there are varieties that have adapted for a long time to the climatic-edafic conditions of these areas (Savić, 2003), and such an assortment is called autochthonous or aborigine. The same author states that such a sort of a particular winegrowing region, under the influence of ecological and agro-technical conditions, demonstrates its raw material potential, which forms the basis for the production of grapes of the characteristic composition and properties that give the seal and characteristics of the wine and their quality. The study of the autochthonous sortiment has been gaining importance in recent times.

The basic goal of grape growing is to obtain new high-yielding and high quality varieties with complex resistance, different purposes and time of maturation. The creation of new varieties is based on cross-breeds between different varieties, which in the newly-created hybrids combine the best traits of different parental forms (Nikolić, 2012). In all breeding programs, this goal can be achieved fastest through cross-border crossing (Filipenko, 1973; Vlchev, 1985; Patil and Patil, 1993).

So far, the results of breeding work in the world and in our country have shown that it is possible to combine resistance to multiple fungal diseases and good grapes in the same genotype (Vojtovič, 1981; Eibach, et al., 1989; Cindric, et al., 1991; Cindric, et al., 1992; Cindric et al., 1994; Avramov et al., 1997; Tarailo et al., 1997; Kozma 2000; Korać et al., 2002;).

For more than a decade, the *Center for Viticulture and Enology* has been working on the creation of new varieties of vines through hybridization with the aim of combining the desirable properties of selected parental partners in the genotype of one of their descendants. From numerous combinations of crosses, a large number of hybrids of interest are recognized for recognition as new varieties or for further breeding work.

MATERIAL AND METHOD

Investigations were carried out in 2007-2009, on the experimental field of the Center for Viticulture and Enology in Nis (Serbia).

Vineyard where he conducted testing was erected in 1997. The building belongs to a cottage vineyard. The subject genotype is hybrid NI 11-92 obtained from the combination of the Prokupac x Game Black crossing. Growing form of vine is "Karlovac", planting space 3.0 x 1.2 m, so that the number of 2.78 vines per hectare. On each vine after pruning were left a total of 23 buds per vine. In the course of carrying out experiments in the vineyard were applied standard cultural practices. Examination includes the following characteristics: time of movement of fennel, flowering time, maturation time, cluster mass, yield and quality of grapes (sugar content and total acids). As the time of movement of the pellets, the date when 50% of the rim of the flock was opened, as the time of flowering, was the date when 50% of the flowers were opened in the flower, and as the date of harvest, the date of harvest. At the time of harvest, the yield of grapes was determined per square meter. The sugar content in the wider was determined on a stable ABBE refractometer and the total acid content per pH meter.

RESULTS AND DISCUSSIONS

The results of the research relating to the description of the perspective hybrid of the vine are shown in Table 1.

The investigated hybrid in this paper mainly meets the set goals of the selection. The highest number of positive properties highlight the properties of satisfactory yield and quality of grapes, a harmonious ratio of sugar and total acids to wider.

Hybrid NI 11-92 was obtained by crossing varieties Prokupac x Game black. The sprout of the berries is black. Phenological observations have registered the dates of the beginning of the emergence of more important phenophases of development. The results of the examination of pheno- phases in the development of grape seeds are the mean values of the three-year follow-up of their origins. The beginning of flowering in all genotypes falls in the last decade of May. Grape growing (shark) falls mainly in the third decade of July and the first decade of August. Šarak was recorded at the end of July, and grape harvesting was mainly done in the second decade of September. The total number of days from the movement of herdsman to grape harvesting in the examined genotype is 156 days.

On the basis of the harvest date and the number of days from the activation of the rim to harvest, the genotype can be characterized as medium late or late.

Fertility genotype, as one of the most important characteristics, was determined by indicators of grape yield (kg) per square inch and weight of one cluster (g). To a large extent, these indicators are genotype characteristics, but depend on a number of other factors.

Grapes mature in mid-September. It is yielded (4.7 kg / inch). It has a medium-sized cluster (171.10 g) and medium-sized berries (g). The grapes are of a harmonious taste. Sugar contains a high amount of sugar (21.61%) and a mean amount of total acid (6.40 g / l). The genotype of the genotype, as one of the most important characteristics, was determined by the yield indicators of grapes (kg) per square inch and the mass of one cluster (g). To a large extent, these indicators are genotype characteristics, but depend on a number of other factors.

The average cluster mass of the examined genotype ranged from 171.35 g. The content of sugar in grape genotype was 21.61%. The content of the total acids in the grape was from 6.40 g / l. More important agrobiological and economic-technological characteristics of the new genotype (Table 1) show that this is a gender and quality variety. (Table 1).

Table 1

Tab.1. Growth stages of development of seedlings

Hybrid	Crossing combination	Purpose genotype	Start phenophase					The number of days movement-vintage
			Constriction	Activating buds	Flowering	Ripening grapes	Harvest	
NI 11-92	Prokupac x Game	Wine	28.03.	14.04.	26.05.	28.07.	18.09.	156

Table 2

Tab.2. Yield and grape quality in intraspecies grapevine hybrids (2007-2009)

Hybrid	Crossing combination	Yield (kg/vine)	Bunch weight (g)	Berry weight (g)	Sugar (%)	Total acid (g/l)
NI 11-92	Prokupac x Game crni	4,70	171.10	1,67	21.61	6.40

CONCLUSIONS

In the examined period (2007-2009) in Nis grape growing region, ruled by favorable environmental conditions for the normal development of the grapevine.

Vineyard cultivation is a process that is constantly flowing. The basic goal of cultivating grapevine is the production of new high-yielding and high-quality varieties of different purposes and times of maturation. Creation of new varieties is based on cross-breeds between different varieties, which in the newly-created hybrids combine the best features of different parental forms.

So far, many goals have been achieved, a great number of methods have been developed and enviable results have been achieved. The largest number of new varieties and substrates was created by the method of planned hybridization, and significantly smaller number of methods of clonal selection and induced mutations. And new biotechnology methods give noticeable results. For future generations, with faster development of science and new results in this field, they contribute to even greater development of viticulture.

The investigated hybrid in this paper mainly meets the set goals of the selection. The highest number of positive properties of the hybrid has satisfactory yields and cluster mass, as well as a harmonious ratio of sugar and total acids to the wider.

Based on the study of the wine grape genotype for wine production, it can be concluded that the isolated new genotype has exhibited positive fertility characteristics and quality of grapes and that further research on the analysis and examination of the perspective genotype should be directed.

BIBLIOGRAPHY

1. Avramov, L., Tadijanović, Đ., Polak, V., Žunić, D., Sivčev, B., N. Gašić., (1997): Novi genetički kapaciteti vinove loze Poljoprivrednog fakulteta u Zemunu. *Savremena Poljoprivreda* 47(5-6):79-84.
2. Cindrić, P., Korać, N. and M. Medić., (1991): A new grape variety resistant to *Plasmopara viticola*. *Genetika* 23(3):259-270.
3. Cindrić, P., Korać, N., Medić, M. and I. Kuljančić., (1992): Important biological and technological characteristics of four new grapevine cultivars developed by interspecies hybridization. *Journal of Scientific Agricultural Research* 53(1-4):59-66.
4. Eibach, R., Diehl, H. and G. Alleweldt., (1989): Untersuchungen zur vererbung von rezistenten eigenschaften bei reben gegen *Oidium tuckeri*, *Plasmopara viticola* und *Botrytis cinerea*. *Vitis* 28(4):209-228.
5. Filippenko, I.M., (1973): Perspektivnost otdalenoj gibridizacii v selekcii vinograda. *Vinodelie i Vinogradarstvo SSSR* 1:33-34.
6. Korać, N., Cindrić, P., Kovač, V. and P. Kozma., (2002a): Novostvorena sorta vinove loze - Kosmopolita. *Savremena poljoprivreda* 51(1-2): 35-40.
7. Korać, N., Cindrić, P., Kovač, V. and M. Medić., (2002b): Nova sorta vinove loze - Petka. *Zbornik naučnih radova sa XVI savetovanja agronoma, veterinarara i tehnologa* 8(1): 269-274.
8. Kozma P., (2000). Winegrape breeding for fungus disease resistance. *Acta Horticulturae* 528(2):505-510.
9. Nikolić, D. (2012): Oplemenjivanje vinove loze. Fleš-Zemun. Beograd.
10. Patil, S.G. and V.P.Patil, (1993): Inter-specific hybridization in grapes (*Vitis* species). *Indian Journal of Horticulture* 50(1): 31-35.
11. Savić, S., (2003): Ekološki uslovi i autohtone vrste vinove loze u Crnoj Gori, Plantaže, Podgorica.
12. Tarailo, R., (1997): Novi genetički potencijali vinove loze u Institutu „SRBIJA“ dobijeni hibridizacijom. *Savremena poljoprivreda*, Novi Sad, 3-4, 133-137.
13. Tarailo, R., [Dorđević, J.](#), [Mošić, I.](#), [Milošević, G.](#), [Ranković, V.](#), [Stanković, S.](#), (1998): Perspektivni genotipovi vinove loze za stono grožđe i vino stvoreni u Nišu. *Poljoprivreda*, Beograd, 388-389, 24-28.
14. Vlčev, V., (1985): Rezultati ot međuidova hibridizacija pri lozata. *Genetika i Selekcija* 18(4):348-352.
15. Vojtovič, K.A., (1981): Novie kompleksno-ustojčivie sorta vonograda. *Kartja Moldovenjaske*, Kišinev.