Chelonian Conservation And Biology

Vol. 19 No. 1 (2024) | https://www.acgpublishing.com/ | ISSN - 1071-8443

DOI: doi.org/10.18011/2024.01(1).283.293

AGROBİOLOGİCAL PARAMETERS OF SOME LOCAL, AND İNTRODUCED COLLECTİBLE GRAPE VARİETİES, GROWN İN THE CONDİTİONS OF THE ABSHERON DİSTRİCT

V.S.Salimov[1*], A.S.Huseynova[2], S.Ş. Abdulaliyeva[3], M.M. Alekberova[4], F.A.Aslanova[5]

[1*,2,3,4,5]The Scientific-Research Institute of Viticulture and Wine-making, of the Ministry of Agriculture of the Republic of Azerbaijan, Absheron district, Mehdiabad settlement, Azerbaijan State Agrarian University, of the Republic of Azerbaijan, Ganja

***Corresponding Author:** V.S.Salimov

E-mail: vugar_salimov@yahoo.com

Summary. The article presents the results of the research work on the study of agrobiological parameters, morphological and technological characteristics of some local (Ag pishraz, Gara kechimemesi, Gara pishraz, Gara urza, Gara khatyny, Gozal uzum, Gomushimeme, Galshan, Ganja kechimemesi, Khalbasar) and introduced (Danaburnu, Dekabrskiy, Janjal kara, Dnestrovskiy rozovy, Doina, Ichkimar, Cardinal, Kuljinskiy, Moldova, Muscat Italian, Pobeda, Presentabill, Sultani, Taifi pink, Tuya tish) collectible table grape varieties grown in the conditions of the Absheron district.

In the course of the scientific-research work, classical and modern research methods were used, such as the Mann-Whitney Wilcoxon U-criterion, the Student's t-criterion, the Pirson χ^2 criterion, mathematical and statistical analysis, digital description of varieties according to the international ampelographic descriptors and assessment of prospects of varieties according to the "ideal variety" innovative model, proposed by the OIV, etc.

As a result of mathematical and statistical processing of the data obtained during the study, it was revealed that the yield indicators of the studied grape varieties Ichkimar, Muscat Italian, Pobeda, Presentabill, Taifi pink and Tuya tish significantly exceed the control variety Danaburnu. For the rest of the varieties, the difference with the control variety was insignificant.

Keywords: grapes, bunch, introduced variety, yield, quality, mathematical and statistical analysis, collection garden

Introduction. For many centuries, since the ancient times of history, Azerbaijani landowners engaged in viticulture and wine-making have brought valuable grape varieties from foreign countries and grown them on their lands in order to obtain high-quality grape products. Nowadays, during the revival of the viticulture and wine-making industry, the introduction of grapes is becoming particularly relevant, since the enrichment of the varietal composition of the republic's

vineyards with high-quality introduced grape varieties contributes to accelerating the development and increasing the profitability of the industry.

The presence of a rich, diverse gene pool of grapes in countries with developed viticulture is explained by the activity carried out in ampelographic collections, namely: the constant replenishment of collections with varieties from various countries of the world and the enrichment of the gene pool of grapes by breeding new varieties and hybrids.

Introduction of grapevine is considered the most effective, easy and quick way to enrich the assortment of vineyards of any zone with the necessary economically valuable and selectively significant varieties and hybrids. Cultivation of any introduced grape varieties in areas with different soil and climatic conditions allows us to study their reaction to environmental factors and choose the best of them. Currently, theoretical provisions and methods of grape introduction are being developed. When introducing grapevine, first of all, it is necessary to take into account the ecological conditions of the region. Then it is necessary to study the biological features of the introduced variety, determine its resistance to environmental factors and some other parameters.

Based on the results obtained during the study of introduced grape varieties in ampelographic collections, it is collected primary information about the yield capacity, crop quality, ecological plasticity and bioecological properties of these varieties.

The comprehensive study of introduced grape varieties in specific soil and climatic conditions of Azerbaijan, the selection of the most adaptive, productive and competitive of them and their rational placement in zones is important for the intensive development of viticulture and wine-making in the republic.

Material and methods of the research. Local (Ag pishraz, Gara kechimemesi, Gara pishraz, Gara urza, Gara khatyny, Gozal uzum, Gomushimeme, Galshan, Ganja kechimemesi, Khalbasar) and introduced (Danaburnu, Dekabrskiy, Janjal kara, Dnestrovskiy rozovy, Doina, Ichkimar, Cardinal, Kuljinskiy, Moldova, Muscat Italian, Pobeda, Presentabill, Sultani, Taifi pink, Tuya tish) table grapevine varieties grown in the conditions of the Absheron district were selected as the research material. Morphological, agrobiological indicators of the studied grapevine varieties (vegetation period, yield elements, etc.), mechanical and chemical composition of the fresh grapes were studied by traditional and modern methods [3, 5, 9, 13, 14]. The prospects of the varieties were evaluated in accordance with the new "ideal variety" model developed and proposed by OIV [2, 3, 5, 10, 13, 14]. Nonparametric (Wilcoxon Mann Whitney's U-test) and parametric (Student's t-test) methods were used to determine the degree of reliability of the results obtained by quantitative indicators. The reliability of the results obtained by quality indicators was determined using Pearson's x^2 criterion. Digital data processing was carried out using the method of mathematical and statistical analysis [6].

The main part. Below is a brief information about the origin and distinctive features of the introduced grape varieties studied by us.

Moldova. It is the Moldovan table grape variety of late ripening, bred by crossing the Central Asian variety Guzal kara and the French complex interspecific hybrid Save Villard 12-375 (Villard

Blanc). The bunches of the Moldova variety are small, of medium density, conical in form. The berries are large, ovate, dark purple, and black when fully ripe. The skin of the berries is covered with a thick wax layer. The yield of the variety is very high. Due to the long maturation, grapes accumulate a lot of sugar (about 19%). The harvest can be consumed fresh and also can be used for preparing various grape products. The firm structure of the berries ensures high transportability and keeping quality. Grapes can be stored for up to six months. The variety is highly resistant to fungal diseases and gray rot.

Dekabrskiy. It is the Moldovan table grape variety of medium time of ripening, bred by crossing the varieties Villar Blanc and Corna Nyagra. The bunches are conical, of medium-sized and medium-density. The berries are medium and large, egg-shaped, purple, have a harmonious pleasant taste and a special aroma. The variety gives high and stable harvests. Suitable for long-term storage. Resistant to diseases and pests. Grapes can χ^2 be stored until December. Hence the name of the variety – "Dekabrskiy" (December grapes).

Dnestrovskiy rozoviy. It is the Ukrainian universal grape variety of late ripening, obtained by crossing varieties VIR II-35-20 (hybrid of Nimrang and Amur varieties) and Matyash Yanosh. The grapes of the variety are of medium size and large, cylindrical or cylindrical-conical, medium density or dense. The berries are medium-sized, ovate, pink or dark pink, with a thick waxy coating. The skin is thin, but strong. The flesh is meaty and juicy. The grape harvest is used fresh and to produce ordinary wine and juice. The variety is suitable for transportation and long-term storage. The yield and resistance to diseases and pests is high.

Ichkimar. It is the Uzbek table grape variety of late ripening. The bunches are large, conical, often with one wing, of medium density. The berries are very large, elongated, ovate or egg-shaped, dark red, darker at the tip. The skin is thin, tender. The flesh is firm, crispy. The taste is very pleasant, typical of classic Asian varieties, with the aroma of sandalwood, flowers and honey. The variety is characterized by high productivity and resistance to diseases and pests.

Kuljinskiy. It is the universal table-wine variety of medium-late ripening. This variety was imported from China (Kulja city) to Semirechye (present-day Almaty region) at the end of the XIX century. Currently, the Kuljinskiy is one of the main varieties in the vineyards of Kazakhstan. It is also available in small quantities in Kyrgyzstan (Chui Valley). The bunches of this variety are large and very large, very dense, cylindrical or cylindrical-conical in shape, with short wings at the base. The berries are medium-sized, roundish or slightly obovate, deformed from compression in dense bunches, of various colors – from light green with a slight pinkish tinge to bright and dark pink. The skin is of medium thickness, quite strong. The flesh is juicy. The taste is simple, sour-sweet. The yield is high. Resistance to diseases and pests is average. The harvest is suitable both for fresh consumption and for the production of natural grape juice, table wines, cognac and champagne materials and other wine-making products.

Presentabill. It is the Bulgarian breeding table grape variety of medium-late ripening period. The bunches are medium and large, medium density, conical. The berries are large and very large, white or light yellow, when fully ripe, dark yellow, golden or amber, have a pleasant sour-sweet taste and delicate aroma. The skin is strong, but thin, slightly translucent. The variety has

high quality characteristics, is unpretentious in care, resistant to diseases and frost, gives very high harvest (120-140 c/ha). The indicators of marketability and transportability of this variety are very high. The harvest can be stored on vines for a long time.

Tuya tish. It is the Central Asian table grape variety of late ripening. This variety widely spread in the Tashkent, Samarkand and Bukhara regions of Uzbekistan and in the Hisar Valley of Tajikistan. Translated from Uzbek, "tuya tish" means "camel's tooth". In the Tashkent region, the variety is also called Botous, Maizi-potous, and in Tajikistan it is called Dondony-shtur, which also means "camel's tooth" in Tajik. The bunches of the variety are large, cylindrical or cylindrical-conical, dense. The berries are large and very large, ovate or slightly elongated, somewhat deformed due to density. A groove runs along the berry, which divides it into two equal parts, creating the appearance of two teeth. That is why the variety was named "camel's tooth". The color of the berries is yellowish-green. The skin is thin, but strong, easily separates from flesh, has a weak waxy coating. The flesh is firm, crispy, juicy. The taste is simple. The yield of the variety is medium and high. Resistance to diseases and pests, transportation and storage is average or below average.

Muscat Italian. It is the table grape variety of hybrid origin. It was bred in 1911 by the Italian breeder Alberto Pirovano by crossing varieties of Bican (Napoleon's shasla) and Muscat Hamburg. During the Soviet Union, this variety was first grown at the Ukrainian Research Institute of Viticulture and Wine-making named after V.E.Tairov. Some time later, Muscat Italian was included in the ampelographic collection of the Ganja Experimental Station of the Azerbaijan Research Institute of Viticulture and Wine-making. The bunches of the variety are large, cylindrical or cylindrical-conical, of medium density. The berries are large, ovate or egg-shaped. The flesh is meaty, juicy, has a harmonious taste and nutmeg aroma with notes of citron. The skin of the berries is matte, has a waxy coating, yellow-amber in color and strong, which ensures good transportability of the variety. The yield is potentially high, but unstable. The ability to adapt is high.

Cardinal. It is one of the most valuable, highly productive table grape varieties of a very early ripening period. This variety is grown in twenty countries of the world. It was bred in 1939 in the state of California by E. Snyder and F. Harmon. Previously, it was believed that the Cardinal variety was obtained as a result of crossing a variety of Algerian origin Ahmar bou Ahmar (Flame Tokay) with the French variety Alphonse Lavalle (Ribier), but further studies have shown that this is not true. DNA analysis reliably established the absence of Flame Tokay's genes in the Cardinal variety, after which it was revealed that the maternal form is the Coroleva vinogradnikov variety. The bunches of the variety are cylindrical-conical in shape (sometimes with a wing), quite large, but loose. The berries are large, ovate or roundish-ovate, with a groove on the surface. The skin is strong, with a smoky waxy coating, has a dark red-purple color. The flesh is juicy, slightly crispy. The taste is very pleasant, sour-sweet, with a slight nutmeg aroma. The yield is high (up to 20-25 kg from one vine). The crop can be stored for a long time without loss of quality.

Doina. İt is the universal (table-technical) hybrid grape variety of late ripening. It was bred by the joint efforts of scientists of the "Viyerul" Moldovian Scientific-Industrial Association for

viticulture and the Chisinau Agricultural Institute. It is a result of crossing the Moldavian variety with a hybrid Seedling No. 35 × Varusse. The bunches of the Doina variety are medium-sized, cylindrical in shape, very dense. The berries are medium or large, roundish or elliptic, dark blue or dark purple in color. The main advantage of the variety is its high yield, reaching up to 190 c/ha. The variety has high root immunity and resistance to most diseases.

Taifi pink. It is the table variety of very late ripening. It has been known since ancient times. In the VII-VIII centuries AD, it was brought by the Arabs to Central Asia from the Arabian port of Taef (hence the name of the variety). It is widespread in most countries of the world with developed viticulture. The bunches of the variety are large or very large, conical or cylindrical, with strongly developed lateral lobes, loose. The weight of one bunch sometimes reaches seven kilograms. The berries are very large, oblong-ovate or barrel-shaped, with a beveled tip. Sometimes there are berries with a shallow groove on the top. The color of the berries is pink with a purple tinge. The flesh is meaty, crispy. The variety tolerates transportation well and is stored for a long time. Taste and commodity indicators are high. The yield is good and stable.

Sultani. It is the Central Asian universal (table-raisin) variety of medium-late ripening period. It is widely distributed in Tajikistan, Uzbekistan, as well as in Kyrgyzstan and Azerbaijan. The bunches of the variety are large, cylindrical-conical, sometimes winged, of medium density. The berries are large, ovate, greenish-yellow, when fully ripe, amber with a brown tan on the sunny side. The skin is transparent, with brown dots. The flesh is crispy. The variety is characterized by high yield. Suitable for long-term storage. It is well transported. In addition to fresh consumption and the production of raisins, grapes are used for the preparation of table and dessert wines, materials for strong wines and cognacs.

Janjal kara. It is the high-yielding native table grape variety of Uzbekistan, maturing in average time. The bunches of the variety are medium-sized and large, conical in shape, loose. The berries are ovate-oblong, with a slightly blunted tip, dark purple, almost black in color, covered with a thick waxy layer. The flesh is meaty-juicy, with pleasant, harmonious taste. The variety is characterized with average yield capacity. It is relatively resistant to diseases and pests, transportable. Grapes are used for fresh consumption, export and winter storage, as well as for the preparation of raisins, compotes and marinades.

Pobeda. It is the Uzbek table grape variety of late ripening, bread by crossing the varieties Zabalkanskiy and Muscat Hamburg. The creators of the Pobeda variety are well-known scientists of the Soviet era A.M.Negrul and M.S.Zhuravel. The bunches of the variety are large, cylindrical, of medium density. The berries are large, ovate-elongated, black. The skin is strong, with a weak waxy coating. The flesh is meaty, juicy, slightly crispy. The taste is pleasant, harmonious. The yield of the variety is high. Resistance to pests is average, to fungal diseases is low. The crop is well transported and stored for a long time. It is suitable both for fresh consumption and for the preparation of raisins.

In order to evaluate local and introduced table grape varieties selected as the object of our research, we studied such indicators as total number of buds, number of budding eyes (as a percentage), total number of green shoots, number of shoots without bunches, number of yield shoots (as a

percentage and in units), yield coefficient of shoots, yield coefficient of yield shoots, weight of bunch, yield capacity per vine and per hectare, sugar content of must.

As you know, yield and quality indicators are one of the most important factors that increase the economic and breeding significance of grapes. Taking into account this fact, we conducted a comprehensive study of the agrobiological properties, yield and quality indicators of twenty-five local and introduced table grape varieties grown in the Absheron Experimental Farm of the Azerbaijan Research Institute of Viticulture and Wine-making (see table).

Results and their analysis. In the course of our research work, we calculated the data obtained on the indicators of yield and quality of the studied grape varieties. It was revealed that *the total number of buds* ranged from 38 (Khalbasar, Ag pishraz, Gara pishraz, Cardinal) – 66 (Taifi pink). For the remaining varieties, the total number of buds was: 64 pcs. (Sultani), 56 pcs. (Gomushimeme, Muscat Italian, Pobeda), 55 pcs. (Moldova), 54 pcs. (Danaburnu, Tuya tish), 52 pcs. (Dekabrskiy), 48 pcs. (Gara kechimemesi, Ganja kechimemesi, Ichkimar, Janjal kara), 46 pcs. (Gara urza, Gozal uzum, Dnestrovskiy rozoviy, Kuljinskiy, Presentabill), 42 pcs. (Gara khatyny, Galshan) and 39 pcs. (Doina).

The indicator of *the number of budding eyes* in the studied varieties varied in the range of 82.6 (Gara urza) – 92.1% (Khalbasar, Cardinal) and respectively amounted to: 91.3% (Dnestrovskiy rozoviy), 91% (Muscat Italian, Pobeda), 90.7% (Danaburnu), 90.5% (Gara khatyny), 90.4% (Dekabrskiy), 89.6% (Janjal kara), 89.3% (Gomushimeme), 89.1% (Kuljinskiy, Sultani), 88.1% (Galshan), 87.9% (Taifi pink), 87.5% (Ganja kechimemesi, Ichkimar), 87.2% (Doina), 87% (Gozal uzum), 86.9% (Presentabill), 86.8% (Ag pishraz), 85.4% (Gara kechimemesi), 84.2% (Gara pishraz), 83.6% (Moldova), 82.6% (Gara urza).

Analysis of the data on *the number of green shoots* showed that the varieties Taifi pink, Sultani, Muscat Italian, Pobeda and Gomushimeme formed a relatively large number of green shoots (58,57,51,51,50). The varieties Danaburnu, Tuya tish, Dekabrskiy, Moldova, Janjal kara, Ganja kechimemesi, Dnestrovskiy rozoviy, Ichkimar, Gara kechimemesi and Gozal uzum had a smaller number of green shoots (49, 47, 46, 43, 42, 41, 40). The least green shoots were noted for the varieties Gara urza, Gara khatyny, Galshan, Khalbasar, Cardinal, Doina, Ag pishraz and Gara pishraz (38, 37, 35, 34, 33, 32).

According to the indicator of *the number of shoots without bunches*, a large difference was observed among the studied varieties. So, this indicator varied within 4 (Doina) – 26 pcs. (Taifi pink) and accordingly amounted to: 22 pcs. (Gomushimeme, Sultani), 21 pcs. (Danaburnu, Tuya tish), 18 pcs. (Galshan, Pobeda), 17 pcs. (Moldova), 16 pcs. (Gara kechimemesi, Gara khatyny, Presentabill), 15 pcs. (Dnestrovskiy rozoviy, Janjal kara), 14 pcs. (Gara urza, Gozal uzum), 13 pcs. (Cardinal), 12 pcs. (Ag pishraz, Dekabrskiy, Muscat Italian), 11 pcs. (Khalbasar, Kuljinskiy), 10 pcs. (Ganja kechimemesi, Ichkimar) and 9 pcs. (Gara pishraz).

The biological yield of a grapevine (mass of organic crop) depends on the leaf surface area, the vital activity of the vine and the duration of crop formation. The economic (real) yield is determined by the indicators of yielding of the vine, namely by the number of yield shoots, the number and weight of bunches on the shoots. The higher the value of these indicators, the higher

the average yield of the grapevine. The analysis of the digital data obtained in determining the number of yield shoots in percentage and quantitative terms showed that *the number of yield shoots* in the studied varieties ranges from 19 (Galshan) to 39 (Muscat Italian). Relatively more yield shoots were formed at the varieties Dekabrskiy, Sultani (35), Pobeda (33), Ganja kechimemesi, Ichkimar, Taifi pink (32), Kuljinskiy and Doina (30), comparatively lesser shoots were noted at the varieties Moldova (29), Danaburnu, Gomushimeme, Janjal kara (28), Dnestrovskiy rozoviy (27), Gozal uzum, Tuya tish (26), Gara kechimemesi (25), Gara urza, Khalbasar and Presentabill (24). The smallest number of yield shoots was observed on the varieties Gara pishraz (23), Gara khatyny, Cardinal (22) and Ag pishraz (21).

The amount of yield shoots as a percentage varied from 51.4 (Galshan) to 88.2% (Doina). For other varieties, this indicator made 76.5% (Muscat Italian), 76.2% (Ganja kechimemesi, Ichkimar), 74.5% (Dekabrskiy), 73.2% (Kuljinskiy), 71.9% (Gara pishraz), 68.6% (Khalbasar), 65.1% (Janjal kara), 65.0% (Gozal uzum), 64.7% (Pobeda), 64.3% (Dnestrovskiy rozoviy), 63.6% (Ag pishraz), 63.0% (Gara urza, Moldova), 62.8% (Cardinal), 61.4% (Sultani), 61.0% (Gara kechimemesi), 60.0% (Presentabill), 57.9% (Gara khatyny), 57.1% (Danaburnu), 55.3% (Tuya tish), 55.2% (Taifi pink) and 51.4% (Galshan).

A significant difference was found in *the number of bunches* among the studied varieties. This indicator varied in the range of 25 (Gara kechimemesi) – 58 pcs. (Doina). The number of bunches formed for the remaining varieties was: Dekabrskiy – 52 pcs., Muscat Italian – 46 pcs., Ganja kechimemesi – 42 pcs., Dnestrovskiy rozoviy – 41 pcs., Khalbasar – 40 pcs., Pobeda – 38 pcs., Sultani – 37 pcs., Janjal kara, Moldova, Kuljinskiy – 36 pcs., Ichkimar – 35 pcs., Danaburnu, Gara pishraz, Presentabill, Cardinal, Tuya tish – 32 pcs., Gara urza – 30 pcs., Gomushimeme, Gara khatyny, Galshan – 28 pcs., Ag pishraz – 27 pcs., Taifi pink, Gozal uzum – 26 pcs.

A large difference was also observed in *the coefficient of yielding of shoots*, which varied from 0.56 (Gomushimeme) to 1.70 (Doina). The highest yielding coefficient was noted for the varieties Gara pishraz (0.97), Ganja kechimemesi (1.0), Dekabrskiy (1.1) and Khalbasar (1.14).

The yielding coefficient of yield shoots varied within 1.0 (Gomushimeme, Gara kechimemesi, Gozal uzum) – 1.93 (Doina). For other varieties, this indicator was: 1.06 (Sultani), 1.12 (Taifi pink), 1.13 (Ichkimar), 1.14 (Danaburnu), 1.15 (Pobeda), 1.17 (Muscat Italian), 1.20 (Kuljinskiy), 1.23 (Tuya tish), 1.24 (Moldova), 1.25 (Gara urza), 1.27 (Gara khatyny), 1.28 (Janjal kara), 1.29 (Ag pishraz), 1.30 (Presentabill), 1.31 (Ganja kechimemesi), 1.39 (Gara pishraz), 1.45 (Cardinal), 1.47 (Galshan), 1.48 (Dekabrskiy), 1.52 (Dnestrovskiy rozoviy).

Along with the number of bunches, the formation of the real harvest of the grape plant is significantly influenced by the weight of bunches. In the grape varieties studied by us, *the bunch weight index* varied in a fairly wide range: from 184.6 (Doina) to 674.4 gr. (Taifi pink), and amounted to: 186.4 gr. (Khalbasar), 196.3 gr. (Gara pishraz), 218.6 gr. (Gozal uzum), 220.0 gr. (Ag pishraz), 226 gr. (Dnestrovskiy rozoviy), 264.6 gr. (Galshan), 268.5 gr. (Dekabrskiy), 278.5 gr. (Gara khatyny), 286.4 gr. (Danaburnu), 297.8 gr. (Ganja kechimemesi), 316.5 gr. (Janjal kara), 324.4 gr. (Gomushimeme, Cardinal), 330.0 gr. (Gara urza), 342.8 gr. (Sultani), 347.8 gr.

(Moldova), 366.4 gr. (Kuljinskiy), 384.4 gr. (Gara kechimemesi), 386.3 gr. (Muscat Italian), 396.6 gr. (Pobeda), 438.4 gr. (Tuya tish), 475.6 gr. (Presentabill), 476.4 gr. (Ichkimar).

When assessing weight of a bunch by the ampelodescriptor OIV 502, it turned out that there were no very small (less than 100 gr.) bunches among the studied varieties. On six varieties (Gozal uzum, Khalbasar, Ag pishraz, Gara pishraz, Dnestrovskiy rozoviy, Doina) the bunches were evaluated as small (150-250 gr.), on sixteen varieties (Danaburnu, Gomushimeme, Gara urza, Gara kechimemesi, Gara khatyny, Ganja kechimemesi, Galshan, Moldova, Dekabrskiy, Kuljinskiy, Tuya tish, Sultani, Muscat Italian, Cardinal, Janjal kara, Pobeda) – as average (250-450 gr.). And only on the Taifi pink variety, the bunches were encoded as large (650-950 gr.).

The studied grape varieties showed different results in terms of *yield per vine*. The lowest indicator was noted in Gozal uzum variety (5.7 kg/vine), the highest – in Taifi pink variety (18.3 kg/vine). For the remaining varieties, the harvest from the vine was: 5.9 kg (Ag pishraz), 6.3 kg (Gara pishraz), 7.4 kg (Galshan), 7.5 kg (Khalbasar), 7.8 kg (Gara khatyny), 9.1 kg (Gomushimeme), 9.2 kg (Danaburnu), 9.3 kg (Dnestrovskiy rozoviy), 9.6 kg (Gara kechimemesi), 10.4 kg (Cardinal), 10.7 kg (Doina), 11.4 kg (Janjal kara), 12.5 kg (Moldova), 12.7 kg (Sultani), 13.2 kg (Kuljinskiy), 13.9 kg (Dekabrskiy), 14.0 kg (Tuya tish), 15.1 kg (Pobeda), 15.2 kg (Presentabill), 16.7 kg (Ichkimar), 17,0 kg (Muscat Italian).

During the study, we identified a difference between the studied varieties and the control variety in terms of vine yield. It turned out that yielding of most varieties inferior to the control variety Danaburnu. As can be seen from the table, the harvest from the vine of the varieties Gomushimeme, Gara khatyny, Galshan, Khalbasar and Gozal uzum is lower than that of the control variety Danaburnu and has a negative value. The results of statistical analysis showed that the varieties Taifi pink, Muscat Italian, Ichkimar, Presentabill, Pobeda and Tuya tish reliability of average vine yields relative to control (according to the U-criterion) and the average difference with the control (Δ %) is much higher. In other varieties, the difference with the control was assessed as unreliable. When calculating the average difference with the control, it turned out that in the varieties Gara urza, Gara kechimemesi, Ganja kechimemesi, Ag pishraz, Moldova, Dekabrskiy, Kuljinskiy, Cardinal, Doina, Sultani, Janjal kara, Dnestrovskiy rozoviy this indicator is positive and amounts to 1.1-98.9%.

The yield per hectare of the studied grape varieties also varied in a wide range: from 126.7 c/ha (Gozal uzum) to 539.9 c/ha (Taifi pink). The Muscat Italian, Presentabill, Ichkimar, Pobeda, Tuya tish and Dekabrskiy varieties had relatively high yields per hectare and, respectively, amounted to: 395.5 c/ha, 387.7 c/ha, 371.1 c/ha, 335.5 c/ha, 311.1 c/ha, 308.9 c/ha. At the varieties Kuljinskiy, Sultani, Ganja kechimemesi, Moldova, Janjal kara, Doina, Gara urza, Gara kechimemesi and Dnestrovskiy rozoviy yield per hectare was lower and respectively amounted to: 293.3 c/ha, 282.2 c/ha, 277.8 c/ha, 253.3 c/ha, 237.8 c/ha, 231.1 c/ha, 220.0 c/ha, 213.3 c/ha, 206.6 c/ha.

Estimation of yield per hectare according to the ampelodescriptor OIV 504 showed that there are no varieties with a very low (up to 40 c/ha), low (40-80 c/ha) and average (90-120 c/ha) yield

index. The yield of five varieties (Gozal uzum, Galshan, Khalbasar, Ag pishraz, Gara pishraz) was assessed as high (7 points), the yield of the remaining varieties – as very high (9 points).

The sugar content of grapes, being one of the important indicators, plays a decisive role in the formation of the quality and technological direction of grapes. The sugar content of the grape varieties studied by us made: 23.4 g/100 cm³ (Gara urza), 23.3 g/100 cm³ (Gara khatyny), 22.6 g/100 cm³ (Danaburnu), 22.4 g/100 cm³ (Ganja kechimemesi, Muscat Italian), 22.3 g/100 cm³ (Gara pishraz), 22.0 g/100 cm³ (Galshan), 21.6 g/100 cm³ (Gara kechimemesi), 21.4 g/100 cm³ (Taifi pink), 20.2 g/100 cm³ (Ag pishraz), 19.8 g/100 cm³ (Pobeda), 19.6 g/100 cm³ (Gomushimeme), 19.4 g/100 cm³ (Gozal uzum, Moldova), 19.2 g/100 cm³ (Janjal kara), 18.8 g/100 cm³ (Dnestrovskiy rozoviy), 18.6 g/100 cm³ (Dekabrskiy, Cardinal), 18.2 g/100 cm³ (Presentabill), 17.8 g/100 cm³ (Kuljinskiy), 17.6 g/100 cm³ (Tuya tish). The lowest sugar content was observed in the varieties Ichkimar and Doina (17.4 g/100 cm³), the highest – in the variety Khalbasar (24.8 g/100 cm³). As can be seen from the data given, the sugar content of the studied varieties meets the requirements for table varieties.

Evaluation of the sugar content of varieties by ampelodescriptor OIV 505 showed that there are no varieties with very low and low (1-3 points – 12-15 g/100 cm³) sugar content. The sugar content was assessed: at 4 varieties as average (5 points – 15-18 g/100 cm^3), at 10 varieties as high (7 points – 18-21 g/100 cm^3), at 11 varieties as very high (9 points – 21-24 g /100 cm^3 and more).

Table: Indicators of yield and quality of introduced collectible grape varieties

Name of the variety	Total number of buds, pcs.	Number of budding eyes, %	Total number of green shoots, pcs.	Number of shoots without bunches, pcs	Number of yield shoots,		Number of bunches, pcs.	The yield coefficient of shoots	The yield coefficient of yield shoots	Weight of bunch, gr.	The yield from the vine and the accuracy of the difference with the control (p)		$\Delta \overline{X}$ %	Yield per hectare, c/ha	Sugar content, g/100 cm^3
					pcs.	%					kg/vine	the difference with the control, kg			
Danaburnu (control)	54	90,7	49	21	28	57,1±2,4	32±0,21	0,65	1.14	286.4	9,2	-	-	204,4±5,2	22,6
Gomushimeme	56	89,3	50	22	28	56,0±1,6	28±0,36	0,56	1,0	324.4*	9,1*	-0,1	1,1	202,2±4,8	19,6
Gara urza	46	82,6	38	14	24	63,0±2,5	30±0,08	0,79	1,25	330.0*	9,9*	+0,7	7,6	220,0±5,6	23,4
Gara kechimemesi	48	85,4	41	16	25	61,0±1,2	25±0,09	0,61	1,0	384.4**	9,6*	+0,4	4,3	213,3±6,6	21,6
Gara khatyny	42	90,5	38	16	22	57,9±1,3	28±0,24	0,74	1,27	278.5*	7,8*	-1,4	15,2	173,3±2,3	23,3

Gozal uzum	46	87,0	40	14	26	65,0±2,8	26±0,36	0,65	1,0	218.6*	5,7*	-3,5	38,0	126,7±2,1	19,4
Ganja kechimemesi	48	87,5	42	10	32	76,2±3,2	42±0,45	1,0	1,31	297.8*	12,5***	+3,3	35,8	277,8±2,5	22,4
Galshan	42	88,1	37	18	19	51,4±0,6	28±0,24	0,76	1,47	264.6*	7,4*	-1,8	19,6	164,4±1,4	22,0
Khalbasar	38	92,1	35	11	24	68,6±1,8	40±0,44	1,14	1,67	186.4	7,5*	-1,9	20,6	166,7±1,8	24,8
Ag pishraz	38	86,8	33	12	21	63,6±2,6	27±0,42	0,82	1,29	220.0*	5,9*	+3,2	34,8	132,0±2,2	20,2
Gara pishraz	38	84,2	32	9	23	71,9±3,2	32±0,36	1,0	1,39	196.3*	6,3*	-2,9	31,5	140,0±2,4	22,3
Moldova	55	83.6	46	17	29	63,0±1,3	36±0,28	0,78	1,24	347.8*	12,5***	+3,3	35,8	277,8±3,1	19,4
Dekabrskiy	52	90,4	47	12	35	74,5±1,6	52±0,46	1,1	1,48	268.5*	13,9***	+4,7	51,1	308,9±2,6	18,6
Dnestrovskiy rozoviy	46	91,3	42	15	27	64,3±1,3	41±0,52	0,97	1,52	226.4*	9,3*	+0,1	1,1	206,6±1,7	18,8
Ichkimar	48	87,5	42	10	32	76,2±1,4	35±0,35	0,83	1,13	476.4***	16,7***	+7,5	81,5	371,1±1,9	17,4
Kuljinskiy	46	89,1	41	11	30	73,2±1,6	36±0,21	0,87	1,20	366.4**	13,2***	+4,0	43,5	293,3±2,1	17,8
Presentabill	46	86,9	40	16	24	60,0±1,7	32±0,19	0,80	1,30	475.6***	15,2***	+6,0	65,2	387,7±2,2	18,2
Tuya tish	54	87	47	21	26	55,3±2,8	32±0,08	0,68	1,23	438.4***	14,0***	+4,8	57,2	311,1±1,3	17,6
Muscat Italian	56	91,0	51	12	39	76,5±3,8	46±0,11	0,90	1,17	386.3**	17,8***	+8,6	93,5	395,5±2,5	22,4
Cardinal	38	92,1	35	13	22	62,8±2,1	32±0,41	0,91	1,45	324.4*	10,4***	+1,2	13,4	231,1±1,5	18,6
Doyna	39	87,2	34	4	30	88,2±5,4	58±0,93	1,70	1,93	184.6*	10,7**	+3,5	38,0	237,8±1,7	17,4
Taifi pink	66	87,9	58	26	32	55,2±1,3	26±0,09	0,62	1,12	674.4***	18,3***	+9,1	98,9	539,9±3,6	21,4
Sultani	64	89,1	57	22	35	61,4±1,5	37±0,25	0,65	1,06	342.8*	12,7***	+3,5	38,0	282,2±1,2	18,4
Janjal kara	48	89,6	43	15	28	65,1±1,2	36±0,33	0,84	1,28	316.5*	11,4**	+2,2	24,0	253,3±1,4	19,2
Pobeda	56	91,1	51	18	33	64,7±1,4	38±0,14	0,74	1,15	396.6**	15,1***	+5,9	64,1	335,5±1,5	19,8

Note: 1) * - p>0,05; * * -p<0,05; *** - p<0,001; 2) p - accuracy of the difference with the control (according to the U-criterion); 3) $\Delta \overline{X}\,\%$ - *the difference in yield compared to the control, in %*

References

1. Abdulaliyeva, S.S. Viticulture / S.S.Abdulaliyeva, M.M. Alekberova - Baku: Muallim, - 2017, - 172 p. (in Azerbaijani)
2. Huseynov, M.A. Evaluation of the prospects of some varieties-introducers according to the "innovative model" / M.A.Huseynov, H.N.Nasibov, A.S.Huseynova [et al.] // Agrarian Science of Azerbaijan, - Baku: - 2018, - No. 4, - pp. 106-110 (in Azerbaijani)
3. Salimov, V.S. Evaluation of the gene pool of Azerbaijani grapes for the purpose of selection and breeding new varieties / Abstract of the dissertation submitted for the degree of Doctor of Agrarian Sciences. Baku, 2017, 47 p. (in Azerbaijani)
4. Salimov, V.S. The study and description of the signs and properties of grape genotypes on ampelodescriptors // Collection of scientific papers of the Azerbaijan Research Institute of Agriculture, Baku: - 2014. volume XXV, - pp. 106-116 (in Azerbaijani)
5. Salimov, V.S. Ampelodescriptor properties of the "ideal variety" in viticulture and a new model for assessing the prospects of varieties // Scientific papers of the Central Botanical Garden of ANAS, - Baku: - 2016. volume XIV, - pp. 10-23 (in Azerbaijani)
6. Salimov, V.S. Ampelographic screening of grapes / V.Salimov. - Baku: Muallim Publishing House, - 2019. - 319 p. (in Azerbaijani)
7. Salimov, V.S., Huseynova, A.S., Huseynov, M.A. Genotypic, phenotypic and agroecological parameters of grape yield // Baku: - Agrarian Science of Azerbaijan, 2020. No. 1, - pp.19-32 (in Azerbaijani)
8. Jabaroglu, Turgut. Processing of grape and its evaluation in the food industry // - Tekirdag: The action plan for the vision of horticulture for 2023, - 2013. - pp. 44-61 (in Turkish)
9. Klimenko V.P., Pavlova I.A., Zlenko V.A. Biotechnology in the selection and reproduction of grapes: historical aspects and prospects of development // Viticulture and wine-making: Collection of scientific papers of Magarach Viticulture and Wine-making Institute. - Volume XLIX. - Yalta, - 2020, - p.39-42 (in Russian)
10. Paskhalidis H.D., Zamanidis P.K., Papakonstantinou L.D., Sotiropoulos S.S., Taskos D.G., Chamurliyev G.O. The role of the ampelographic collection of Greece in the genetic improvement of native varieties and the breeding of new ones // Viticulture and wine-making: Collection of scientific papers of Magarach Viticulture and Wine-making Institute. - Volume XLIX. - Yalta, - 2020, - pp.77-81 (in Russian)
11. Polulyakh A.A., Volynkin V.A. Genetic resources of grapes for introduction and breeding // Viticulture and wine-making: Collection of scientific papers of Magarach Viticulture and Wine-making Institute. – Volume XLIX. - Yalta, - 2020, - p.83-87 (in Russian)