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# AGROBIOLOGICAL EVALUATION AND PRODUCTIVITY OF INTRODUCED GRAPE VARIETIES UNDER THE CONDITIONS OF SOUTHEASTERN KAZAKHSTAN

**Aytenov A.A.**, master of agricultural sciences
asilbek_zero@mail.ru, https://orcid.org/0009-0008-3495-9611
**Tauirbayeva Zh.T.**, master of agricultural sciences
jadira.taurbaeva@mail.ru, https://orcid.org/0000-0002-5472-5205
**Ongar A.N.,** BSc in Agricultural Sciences
aida.ongar02@mail.ru, https://orcid.org/0009-0001-8286-3453
**Kazybayeva S.Zh.**, Candidate in agriculture sciences, Associate Professor
kazybaeva.1967@mail.ru , https://orcid.org/0000-0002-6833-0466
**Azhitayeva L.A.***, PhD
lako_1992@mail.ru , https://orcid.org/0000-0002-8044-3404

*Kazakh Research Institute of Fruit and Vegetable Growing, Almaty city, Kazakhstan*

**Annotation.** The article presents the results of an agrobiological evaluation of introduced grape varieties under the conditions of southeastern Kazakhstan (Talgar experimental farm, Almaty region) for 2024–2025. The aim of the study was to identify the most adapted and highly productive grape genotypes based on a comprehensive assessment of their growth, development, and yield.

The study included the following grape varieties: Early Kibrayskiy, Osobiy, Sochniy, Muscat Susanna, Bobo Zakir, and Hungarian Muscat (control). The research was conducted using standard methods of varietal testing within an ampelographic collection. Phenological stages, biometric parameters of annual shoot growth, and productivity indicators (cluster weight, number of clusters per vine, yield per vine, and total yield) were evaluated.

Bud break occurred in the second decade of April, flowering began in the third decade of May, and harvest maturity was reached in the first to second decades of August. Flowering lasted 13–15 days, and the growing season ranged from 116 to 124 days, corresponding to the biological characteristics of the crop and regional conditions.

The most intensive shoot growth was observed in the Early Kibrayskiy variety. The varieties Sochniy, Bobo Zakir, and Osobiy showed an optimal combination of shoot length and number. The highest yields were recorded for Sochniy (up to 100.2 c/ha), Bobo Zakir (88.1 c/ha), and Osobiy (84.7 c/ha), due to their large cluster size and favorable cluster number.

Based on the comprehensive evaluation, the varieties Sochniy, Bobo Zakir, and Osobiy demonstrated high adaptability and stable productivity and are recommended for commercial cultivation and breeding programs.

**Keywords:** grape, varietal testing, introduction, phenology, yield, adaptability, productivity

**Introduction.** Grapevine (*Vitis vinifera* L.) is one of the most valuable perennial crops in global agriculture and is highly sensitive to soil and climatic conditions, agronomic practices, and varietal characteristics. Under modern conditions, a key direction in viticulture development is the improvement of varietal composition through the introduction of new genotypes with high productivity, stress resistance, and stable product quality.

In regions with a sharply continental climate, such as southeastern Kazakhstan, particular importance is attached to varieties combining early maturity, high yield, proper ripening of annual shoots, and adaptability to abiotic stresses, including temperature fluctuations and water deficit [1–5]. Previous studies have shown that grape productivity largely depends on how well the biological characteristics of a variety match the growing conditions [1,2,6,7].

In southern and southeastern Kazakhstan, improving the varietal assortment is essential due to the limited range of widely cultivated varieties and the need to identify genotypes capable of ensuring stable yields and high-quality production across diverse agroecological zones. Even under favorable conditions, productivity may be constrained by insufficient adaptability, low winter hardiness, poor disease resistance, and inadequate shoot maturation [6, 7].

The timing of phenological stages in grapevines is closely linked to temperature regime, moisture availability, and accumulated heat units. Rising temperatures during the spring–summer period accelerate bud break, flowering, and ripening; however, varietal responses differ significantly [3,4,8–12]. Therefore, phenological observations are essential for evaluating varietal adaptability under new environmental conditions.

Intervarietal differences in phenological timing are particularly important, as they determine resistance to late spring frosts, growing season duration, and yield quality. Under current climate change conditions, varietal selection is considered one of the most effective tools for adapting viticulture systems [5,9,10,13–15].

Modern research indicates that the economic value of a variety is determined not by individual traits but by their combined expression, including growing season length, cluster weight, cluster number per vine, yield level, and product quality [6,11,16–18]. Notably, early maturity does not always correlate with high productivity, which necessitates comprehensive agrobiological evaluation.

An important research direction is the study of annual shoot growth and maturation, as these factors determine winter hardiness, productivity, and vineyard longevity. In foothill and continental regions, these parameters are key indicators of varietal adaptability [2,6,22].

Previous studies in southern Kazakhstan have revealed significant intervarietal variability in yield, cluster weight, and quality traits, emphasizing the need for long-term evaluation of introduced genotypes under specific soil and climatic conditions [6,7,18, 23].

Thus, comprehensive agrobiological evaluation of introduced grape varieties is highly relevant for identifying genotypes with high adaptability and stable productivity in southeastern Kazakhstan.

The aim of this study was to evaluate introduced grape varieties and identify the most adapted and productive genotypes for the region.

**Materials and methods.** The study was conducted in the ampelographic collection of the Regional Branch “Talgar” of the Kazakh Research Institute of Fruit and Vegetable Growing, located in the Talgar district of the Almaty region (southeastern Kazakhstan).

The study area lies in the foothill zone of the Trans-Ili Alatau and is characterized by hilly terrain. Groundwater occurs at a depth exceeding 10–20 m and does not significantly affect vine growth. The soils are ordinary carbonate chernozems, medium-deep, with a heavy loamy texture. The humus horizon reaches 70–90 cm, with humus content ranging from 3.5 to 4.5%. Soil nutrient availability is moderate in phosphorus and high in potassium. Available phosphorus content is 3.0–3.5 mg/kg, potassium 550–600 mg/kg, and nitrate nitrogen 35–45 mg/kg [24]. The climate is moderately continental, with a high sum of active temperatures (over 3200 °C), long sunshine duration, and relatively low precipitation, creating favorable conditions for grape cultivation. The studied varieties included Early Kibrayskiy, Osobiy, Sochniy, Muscat Susanna, Bobo Zakir, and Hungarian Muscat (control). The results of two-year studies (2024–2025) are presented.

Vines were grown on their own roots under a covering system with irrigation. The planting scheme was 3.0 × 1.5 m. The vineyard was established in 2001. Agronomic practices followed regional recommendations [25]. Phenological observations included recording bud break, flowering stages, and harvest maturity according to standard methods [26, 27]. Biometric parameters (shoot number, shoot length, total growth) were measured directly.

Yield was calculated based on cluster weight and number per vine, with conversion to c/ha [26]. Sugar content was determined according to GOST 27198–87, and titratable acidity according to GOST 32114–2013 [28, 29].

Meteorological data were obtained from the Talgar weather station. Statistical analysis was performed using ANOVA in Microsoft Excel. Differences were evaluated using the least significant difference ($LSD_{0.05}$) [30].

**Results and discussion.** Economic and biological indicators of the same variety may vary significantly from year to year and depend on the meteorological conditions of a particular year. Therefore, the analysis of the obtained data and conclusions regarding varietal characteristics should be conducted with consideration of the weather conditions specific to each year.

The study period was characterized by considerable fluctuations in weather conditions and variations in the duration of the growing seasons. An analysis of the timing of phenological phases of grapevines for 2024–2025 showed that, under the conditions of the Talgar experimental farm, a high level of stability in the onset of the main developmental stages was observed. Bud break in the studied varieties occurred between April 9 and April 17. The earliest dates were recorded for the Early Kibrayskiy and Sochniy varieties (on average, April 10), while the latest was observed in the Bobo Zakir variety (April 17). The onset of flowering ranged from May 21 to May 24. Early flowering was characteristic of the Early Kibrayskiy and Muscat Susanna varieties (May 22), whereas later flowering was observed in the Bobo Zakir variety (May 24). Mass flowering occurred from late May to early June (May 27 to June 3), and the end of flowering was observed in the first decade of June (June 4–10). The duration of flowering averaged 13–15 days (Table 1).

**Table 1 – Timing of phenological phases of grapevines (Talgar experimental farm)**

| Variety | Years | Bud break | Beginning of flowering | Full bloom | End of flowering | Harvest maturity |
|---|---|---|---|---|---|---|
| Hungarian Muscat (st) | 2024 | 14.04 | 25.05 | 02.06 | 09.06 | 12.08 |
| | 2025 | 15.04 | 26.05 | 03.06 | 10.06 | 13.08 |
| | average | 14.04 | 26.05 | 03.06 | 10.06 | 13.08 |
| Early Kibrayskiy | 2024 | 09.04 | 21.05 | 26.05 | 05.06 | 04.08 |
| | 2025 | 10.04 | 22.05 | 27.05 | 06.06 | 05.08 |
| | average | 10.04 | 22.05 | 27.05 | 06.06 | 05.08 |
| Osobiy | 2024 | 13.04 | 22.05 | 30.05 | 06.06 | 07.08 |
| | 2025 | 14.04 | 23.05 | 31.05 | 07.06 | 08.08 |
| | average | 14.04 | 23.05 | 31.05 | 07.06 | 08.08 |
| Sochniy | 2024 | 09.04 | 22.05 | 29.05 | 03.06 | 11.08 |
| | 2025 | 10.04 | 23.05 | 30.05 | 04.06 | 12.08 |
| | average | 10.04 | 23.05 | 30.05 | 04.06 | 12.08 |
| Muscat Susanna | 2024 | 14.04 | 21.05 | 01.06 | 05.06 | 12.08 |
| | 2025 | 15.04 | 22.05 | 02.06 | 06.06 | 13.08 |
| | average | 15.04 | 22.05 | 02.06 | 06.06 | 13.08 |
| Bobo Zakir | 2024 | 16.04 | 23.05 | 31.05 | 04.06 | 13.08 |
| | 2025 | 17.04 | 24.05 | 01.06 | 05.06 | 14.08 |
| | average | 17.04 | 24.05 | 01.06 | 05.06 | 14.08 |

Harvest maturity occurred between August 5 and August 14. The earliest ripening was observed in the Early Kibrayskiy variety (August 5), while the latest was recorded in the

Bobo Zakir variety (August 14). Thus, in southeastern Kazakhstan, the phenological phases of grapevines are characterized by stable timing across years, indicating favorable agroclimatic conditions. The earliest ripening varieties are Early Kibrayskiy and Sochniy, which makes them promising for early production. The Bobo Zakir and Muscat Susanna varieties are characterized by later phenological development, allowing their use to extend the production period. The observed differences in the timing of phenological phases are determined by the biological characteristics of the varieties and can be used in developing a varietal assortment for southeastern Kazakhstan. Analysis of the average timing of grapevine phenological phases for 2024–2025 showed that plant development under the conditions of the Talgar experimental farm is characterized by stability and low interannual variability.

On average, bud break in the studied varieties occurred between April 10 and April 16, with an overall range from April 9 to April 18. This indicates an early onset of the growing season under the conditions of southeastern Kazakhstan.

The onset of flowering ranged from May 22 to May 25, with fluctuations between May 21 and May 27, corresponding to favorable temperature conditions during the spring period. Mass flowering occurred from late May to early June (May 28 to June 2), with a variation range from May 26 to June 4 (Table 2)

**Table 2 – Average timing of grapevine vegetation phases (2024–2025)**

| Development stage | Average date | Range of variation |
|---|---|---|
| Bud break | 10–16april | 09–18april |
| Beginning of flowering | 22–25 may | 21–27 may |
| Full bloom | 28 may – 02 june | 26 may – 04 june |
| End of flowering | 04–08 june | 03–11 june |
| Harvest maturity | 05–14 august | 04–15 august |

The end of flowering occurred in the first decade of June (June 4–8), with slight variations in timing (June 3–11), indicating a stable flowering duration of 13–15 days.

Harvest maturity occurred between August 5 and August 14, with an overall range from August 4 to August 15, indicating that yield formation takes place under optimal agroclimatic conditions. Thus, under regional conditions, the progression of the main grapevine phenological phases is highly stable and corresponds to the biological characteristics of the crop, creating favorable conditions for consistent yields. An analysis of the duration of interphase periods in grapevines for 2024–2025 showed that the studied varieties differ in growth and development rates due to their biological characteristics. The period from bud break to the onset of flowering ranged from 38 to 43 days. The shortest duration was observed in the Muscat Susanna and Bobo Zakir varieties (38 days), indicating a more rapid transition to the generative phase. The longest duration was recorded in the Sochniy variety (43 days), reflecting a more prolonged vegetative growth period (Table 3).

**Table 3 – Duration of interphase periods (2024–2025, average)**

| Variety | Bud break → flowering, days | Flowering duration, days | Growing season, days |
|---|---|---|---|
| Hungarian Muscat (st) | 41 | 15 | 120 |
| Early Kibrayskiy | 42 | 15 | 117 |
| Osobiy | 40 | 15 | 116 |
| Sochniy | 43 | 13 | 124 |
| Muscat Susanna | 38 | 14 | 120 |
| Bobo Zakir | 38 | 13 | 119 |

The duration of flowering in most varieties was 13–15 days, which corresponds to the biological norm for grapevines under moderately continental climate conditions. A shorter flowering period was observed in the Sochniy and Bobo Zakir varieties (13 days), while in the other varieties it ranged from 14 to 15 days.

The total growing season (from bud break to harvest maturity) ranged from 116 to 124 days. The shortest duration was recorded in the Osobiy variety (116 days), characterizing it as early-ripening. The longest duration was observed in the Sochniy variety (124 days), indicating a prolonged period of yield formation. Thus, differences in the duration of interphase periods reflect the diversity of biological characteristics among grape varieties and make it possible to distinguish early-ripening (Osobiy, Early Kibrayskiy) and later-ripening (Sochniy) types, which is important for developing a varietal assortment suited to the conditions of southeastern Kazakhstan.

An analysis of yield and production-related indicators of grape varieties for 2024–2025 revealed significant differences among the studied genotypes. The average cluster weight ranged from 168 g in the Hungarian Muscat (control) variety to 330 g in the Sochniy variety. Large clusters were also observed in the Osobiy (303 g) and Bobo Zakir (309 g) varieties.

The number of clusters per vine ranged from 9 to 18. The highest number was observed in the Hungarian Muscat (control) variety (18 clusters per vine); however, this did not result in the highest yield due to the lower cluster weight. Yield per vine ranged from 1.8 kg (Early Kibrayskiy) to 4.5 kg (Sochniy). The most productive varieties were Sochniy (4.5 kg/vine), Bobo Zakir (3.9 kg/vine), and Osobiy (3.8 kg/vine) (Table 4).

**Table 4 – Yield and production-biological indicators of grape varieties (Talgar experimental farm, 2024–2025)**

| Variety | Year | Average cluster weight, g | Number of clusters per vine | Yield per vine, kg | Yield, c/ha |
|---|---|---|---|---|---|
| Hungarian Muscat (st) | 2024 | 165 | 17 | 2,8 | 62,0 |
| | 2025 | 171 | 18 | 3,1 | 68,9 |
| | average | 168 | 18 | 3,0 | 65,5 |
| Early Kibrayskiy | 2024 | 205 | 8 | 1,6 | 38,0 |
| | 2025 | 215 | 9 | 1,9 | 42,2 |
| | average | 210 | 9 | 1,8 | 40,1 |
| Osobiy | 2024 | 295 | 12 | 3,6 | 80,5 |
| | 2025 | 310 | 13 | 4,0 | 88,8 |
| | average | 303 | 13 | 3,8 | 84,7 |
| Sochniy | 2024 | 320 | 13 | 4,2 | 96,0 |
| | 2025 | 339 | 14 | 4,7 | 104,4 |
| | average | 330 | 14 | 4,5 | 100,2 |
| Muscat Susanna | 2024 | 240 | 12 | 3,0 | 70,0 |
| | 2025 | 252 | 13 | 3,4 | 75,5 |
| | average | 246 | 13 | 3,2 | 72,8 |
| Bobo Zakir | 2024 | 300 | 12 | 3,7 | 85,0 |
| | 2025 | 317 | 13 | 4,1 | 91,1 |
| | average | 309 | 13 | 3,9 | 88,1 |
| | | | | | |
| $HSD_{05}$ | | 14,2 | | 0,28 | 5,6 |

A similar pattern was observed for yield, which ranged from 40.1 to 100.2 c/ha. The highest yields were recorded in the Sochniy (up to 100.2 c/ha), Bobo Zakir (88.1 c/ha), and Osobiy (84.7 c/ha) varieties, due to their large cluster weight and higher number of clusters.

The differences in yield among the varieties exceeded the $LSD_{0.05}$ value (5.6 c/ha), indicating the statistical significance of the results. Thus, based on the combination of productivity traits, the most promising varieties for southeastern Kazakhstan are Sochniy, Bobo Zakir, and Osobiy, which are characterized by high yields, large cluster weight, and stable fruiting. An analysis of biometric indicators of annual grapevine growth for 2024–2025 revealed significant differences among the varieties in shoot growth intensity. The number of shoots per vine ranged from 11 to 18. The highest number was observed in the Early Kibrayskiy variety (18 shoots per vine), while the lowest was recorded in the Muscat Susanna variety (11 shoots per vine) (Table 5).

**Table 5 – Biometric indicators of annual grapevine growth (Talgar experimental farm, 2024–2025)**

| Variety | Year | Number of shoots per vine | Average shoot length, m | Total growth, m per bush |
|---|---|---|---|---|
| Hungarian Muscat (st) | 2024 | 15 | 1,80 | 27,0 |
| | 2025 | 16 | 1,85 | 29,6 |
| | average | 16 | 1,83 | 28,3 |
| Early Kibrayskiy | 2024 | 17 | 1,85 | 31,5 |
| | 2025 | 18 | 1,92 | 34,6 |
| | average | 18 | 1,89 | 33,1 |
| Osobiy | 2024 | 11 | 2,00 | 22,0 |
| | 2025 | 12 | 2,05 | 24,6 |
| | average | 12 | 2,03 | 23,3 |
| Sochniy | 2024 | 11 | 2,10 | 23,1 |
| | 2025 | 12 | 2,20 | 26,4 |
| | average | 12 | 2,15 | 24,8 |
| Muscat Susanna | 2024 | 10 | 1,70 | 17,0 |
| | 2025 | 11 | 1,78 | 19,6 |
| | average | 11 | 1,74 | 18,3 |
| Bobo Zakir | 2024 | 12 | 2,00 | 24,0 |
| | 2025 | 13 | 2,10 | 27,3 |
| | average | 13 | 2,05 | 25,7 |
| $HSD_{05}$ | | 1,1 | 0,10 | 2,1 |

The average shoot length ranged from 1.74 to 2.15 m. The longest shoots were observed in the Sochniy variety (2.15 m), as well as in the Bobo Zakir (2.05 m) and Osobiy (2.03 m) varieties, indicating high growth activity of these genotypes.

Total shoot growth per vine ranged from 18.3 to 33.1 m. The highest values were recorded in the Early Kibrayskiy variety (33.1 m/vine), with relatively high values also observed in the Hungarian Muscat (28.3 m/vine) and Bobo Zakir (25.7 m/vine) varieties. The lowest value was recorded in the Muscat Susanna variety (18.3 m/vine).

The differences in total shoot growth among the varieties exceeded the $LSD_{0.05}$ value (2.1 m/vine), indicating statistical significance. Thus, the Early Kibrayskiy variety demonstrates the highest growth activity, while the Sochniy, Bobo Zakir, and Osobiy varieties exhibit a balanced combination of shoot length and total growth, reflecting their high adaptability to the conditions of southeastern Kazakhstan.

**Conclusion.** The study demonstrated that introduced grape varieties are well adapted to the soil and climatic conditions of southeastern Kazakhstan. Phenological observations showed stable timing of key developmental stages: bud break in mid-April, flowering in late May, and harvest maturity in early to mid-August. The growing season lasted 116–124 days.

The Early Kibrayskiy variety exhibited the highest vegetative growth, whereas Sochniy, Bobo Zakir, and Osobiy showed a balanced combination of growth and productivity.

The highest yields were obtained from Sochniy (100.2 c/ha), Bobo Zakir (88.1 c/ha), and Osobiy (84.7 c/ha), due to their favorable combination of cluster size and number. Overall, Sochniy, Bobo Zakir, and Osobiy demonstrated high adaptability, stable productivity, and strong economic potential. These varieties are recommended for commercial cultivation and use in breeding programs.

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**References:**

[1] **Chupradit, S.,** et al. Agrobiological evaluations of newly introduced grape varieties under the climatic conditions of southern Kazakhstan. Brazilian Journal of Biology. 2024;84:e258275. doi:10.1590/1519-6984.258275.

[2] **Manarova, D.G.,** et al. Development of new competitive grape varieties with different ripening [3] times and high commercial and gustatory qualities bred by the Kazakh Research Institute of Fruit Growing and Viticulture. Biosciences Biotechnology Research Asia. 2015;12(2).

[4] **Parker, A.K.,** et al. Adaptation to climate change by assessing grapevine cultivar differences using temperature-based phenology models. OENO One. 2020;54(3).

[5] **Alikadic, A.,** et al. The impact of climate change on grapevine phenology and variety suitability in the Trentino region. Agricultural and Forest Meteorology. 2019;271:73–87.

[6] **Baltazar, M.,** et al. Adaptation to climate change in viticulture: the role of varietal selection. Plants. 2025;14(1):104.

[7] **Kulzhanov, S.N.,** et al. Effect of climatic conditions on phenological observations, yield components, and biochemical characteristics of grape varieties grown in southern Kazakhstan. Eurasian Journal of Soil Science. 2022;11(2):174–183.

[8] New promising grape varieties in Kazakhstan: materials on long-term varietal studies of grapes in Kazakhstan. 2026.

[9] **Merrill, N.K.,** et al. Exploring grapevine phenology and high temperatures: a review and synthesis. Frontiers in Environmental Science. 2020;8:516527.

[10] **Naulleau, A.,** et al. Evaluating strategies for adaptation to climate change in grapevine production: a systematic review. Frontiers in Plant Science. 2021;11:607859.

[11] **Santos, J.A.,** et al. A review of potential climate change impacts and adaptation options for European viticulture. Applied Sciences. 2020;10(9):3092.

[12] **Ramos, M.C.,** et al. Grapevine phenology of white cultivars in Rueda DO: climate variability and thermal requirements. Agronomy. 2023;13(1):146.

[13] **de Reséguier, L.,** et al. Modeling grapevine phenology at the local scale in the context of climate variability. Agricultural and Forest Meteorology. 2026.

[14] **Arias, L.A.,** et al. Climate change effects on grapevine physiology and biochemistry: benefits and challenges of high-altitude as an adaptation strategy. Frontiers in Plant Science. 2022;13:835425.

[15] **Dinu, D.G.,** et al. Climate change impacts on plant phenology: grapevine (Vitis vinifera) bud break in wintertime in southern Italy. Foods. 2021;10(11):2769.

[16] **Parker, L.E.,** et al. A variety-specific analysis of climate change effects on winegrape

phenology and agroclimate. International Journal of Biometeorology. 2024.

[17] **Maniero, C.R.,** et al. Phenological performance, thermal demand, and yield of fine wine grape cultivars. Agriculture. 2025;15(12):1241.

[18] **Espinosa-Roldán, F.E.,** et al. Phenological evaluation of minority grape varieties in the context of climate change. Horticulturae. 2024;10(4):353.

[19] **Pankin, M.I.,** et al. The Anapa ampelographic collection as the largest center for vine gene pool accumulation and research in Russia. Vavilov Journal of Genetics and Breeding. 2018;22(1):54–59. doi:10.18699/VJ18.331.

[20] **Van, Leeuwen C., Destrac-Irvine A., Ollat N.** Modified grape composition under climate change conditions requires vineyard adaptations. Journal International des Sciences de la Vigne et du Vin. 2017;51:147–154.

[21] **Pérez-Bermúdez, P., Olmo M., Gil J.,** et al. Effects of traditional and light pruning on viticultural and oenological performance of Bobal and Tempranillo vineyards. Journal International des Sciences de la Vigne et du Vin. 2015;49:145–154.

[22] **Ganich, V.A., Naumova L.G. T**he autochthonous Georgian grape variety Rkatsiteli under the conditions of the Lower Don region. Bulletin of Russian Agricultural Science. 2021;4:28–32.

[23] **Van, Houten S.,** et al. Natural genetic variation for grapevine phenology as a tool for adaptation to climate change. Applied Sciences. 2020;10(16):5573.

[24] **Vršič, S.,** et al. The impact of climatic warming on earlier wine-grape phenology and suitability of new varieties. Horticulturae. 2024;10(6):611.

[25] Agrochemical characteristics of soils of Kazakhstan. Almaty: Kazakh Research Institute of Soil Science, 2018. 256 p.

[26] Innovative technologies for cultivation of fruit and berry crops. Moscow: Rosinformagrotekh, 2016. 312 p.

[27] Program and methodology for varietal testing of fruit, berry, and nut crops / edited by E.N. Sedov, T.P. Ogoltsova. Orel: VNIISPK, 1999. 608 p.

[28] Methodology for state varietal testing of agricultural crops. Moscow, 1985. 267 p.

[29] GOST 27198–87. Fruit and vegetable processing products. Methods for determining sugars.

[30] GOST 32114–2013. Juice products. Methods for determining acidity.

[31] **Dospekhov, B.A.** Field experiment methodology. Moscow: Agropromizdat, 1985. 351 p

## ҚАЗАҚСТАННЫҢ ОҢТҮСТІК-ШЫҒЫСЫНДАҒЫ ИНТРОДУКЦИЯЛАНҒАН ЖҮЗІМ СОРТТАРЫНЫҢ АГРОБИОЛОГИЯЛЫҚ БАҒАЛАУЫ ЖӘНЕ ӨНІМДІЛІГІ

**Айтенов А.А.**, ауыл шаруашылығы ғылымдарының магистрі
**Тәуірбаева Ж.Т.**, ауыл шаруашылығы ғылымдарының магистрі
**Оңғар А.Н.,** ауыл шаруашылығы ғылымдарының бакалавры
**Қазыбаева С.Ж.**, ауыл шаруашылығы ғылымдарының кандидаты, қауымдастырылған профессор
**Ажитаева Л.А.**, PhD

*Қазақ жеміс-жидек және көкөніс шаруашылығы ғылыми-зерттеу институты, Алматы қ., Қазақстан*

**Аңдатпа.** Мақалада Қазақстанның оңтүстік-шығыс өңірінде («Талғар» аймақтық филиалы, Алматы облысы) интродукцияланған жүзім сорттарын 2024–2025 жылдарға агробиологиялық бағалау нәтижелері көрсетілген. Зерттеудің мақсаты — аймақ жағдайларына ең жақсы бейімделген және жоғары өнімді жүзім генотиптерін олардың өсуі, дамуы және өнімділігін кешенді бағалау арқылы анықтау.

Зерттеу объектілері ретінде келесі жүзім сорттары алынды: Ранний кибрайский, Особый, Сочный, Мускат Сусанна, Бобо Закир и Мускат венгерский (контроль). Зерттеулер ампелографиялық коллекция базасында және жалпы қабылданған сорттық бағалау әдістемелері бойынша жүргізілді. Бағалау фенологиялық даму кезеңдері, біржылдық өсімнің биометриялық көрсеткіштері және өнімділік элементтері (шырын массасы, бұтадағы шырын саны, бұтадан өнім және өнімділік) бойынша жүргізілді.

Нәтижелер бойынша бүршіктердің ашылуы сәуірдің екінші онкүндігінде, гүлдеудің басталуы мамырдың үшінші онкүндігінде, ал жидектің жинақталатын жетілуі тамыздың бірінші–екінші онкүндігінде болды. Гүлдеу ұзақтығы 13–15 күнді, вегетациялық кезеңі 116–124 күнді құрады, бұл сорттың биологиялық ерекшеліктеріне және өңір жағдайларына сәйкес келеді.

Биометриялық көрсеткіштер бойынша ең қарқынды сабақ өсімі Ранний кибрайский сортында байқалды, ал Сочный, Бобо Закир және Особый сорттары сабақ ұзындығы мен санының оңтайлы үйлесімімен сипатталды. Ең жоғары өнімділік Сочный (100,2 ц/га дейін), Бобо Закир (88,1 ц/га) және Особый (84,7 ц/га) сорттарында тіркелді, бұл шырын массасының жоғары болуы және шырын санының көптігіне байланысты.

Кешенді бағалау нәтижесінде жоғары бейімделгіштік пен тұрақты өнімділігі бар Сочный, Бобо Закир және Особый сорттары бөлініп көрсетілді, оларды өндірісте енгізу және селекциялық жұмыста пайдалану ұсынылады.

**Тірек сөздер:** жүзім, сорттық бағалау, интродукция, фенология, өнімділік, бейімделгіштік.

## АГРОБИОЛОГИЧЕСКАЯ ОЦЕНКА И ПРОДУКТИВНОСТЬ ИНТРОДУЦИРОВАННЫХ СОРТОВ ВИНОГРАДА В УСЛОВИЯХ ЮГО-ВОСТОКА КАЗАХСТАНА

**Айтенов А.А.**, магистр сельскохозяйственных наук
**Тәуірбаева Ж.Т.**, магистр сельскохозяйственных наук
**Онгар А.Н.**, бакалавр сельскохозяйственных наук
**Казыбаева С.Ж.**, кандидат сельскохозяйственных наук, ассоциированный профессор
**Ажитаева Л.А.**, PhD

*Казахский научно-исследовательский институт плодоовощеводства, г. Алматы, Казахстан*

**Аннотация.** В статье представлены результаты агробиологической оценки интродуцированных сортов винограда в условиях юго-востока Казахстана (РФ «Талгар», Алматинская область) за 2024–2025 гг. Цель исследования — выявление наиболее адаптированных и высокопродуктивных генотипов винограда для условий региона на основе комплексной оценки их роста, развития и урожайности.

Объектами исследования служили сорта винограда: Ранний кибрайский, Особый, Сочный, Мускат Сусанна, Бобо Закир и Мускат венгерский (контроль). Исследования проводились на базе ампелографической коллекции с использованием общепринятых методик сортоизучения. Оценивались фенологические фазы развития, биометрические показатели однолетнего прироста и элементы продуктивности (масса грозди, количество гроздей на кусте, урожай с куста и урожайность).

Установлено, что распускание почек происходило во второй декаде апреля, начало цветения — в третьей декаде мая, а съёмная зрелость ягод наступала в первой–второй декаде августа. Продолжительность цветения составляла 13–15 дней, вегетационный период — 116–124 дня, что соответствует биологическим особенностям культуры и условиям региона.

По биометрическим показателям наиболее интенсивный рост побегов отмечен у сорта Ранний кибрайский, тогда как сорта Сочный, Бобо Закир и Особый характеризовались оптимальным сочетанием длины и количества побегов. Наибольшая урожайность установлена у сортов Сочный (до 100,2 ц/га), Бобо Закир (88,1 ц/га) и Особый (84,7 ц/га), что обусловлено высокой массой и количеством гроздей.

В результате комплексной оценки выделены сорта Сочный, Бобо Закир и Особый, отличающиеся высокой адаптивностью и стабильной продуктивностью, что позволяет рекомендовать их для внедрения в производство и использования в селекционной работе.

**Ключевые слова:** виноград, сортоизучение, интродукция, фенология, урожайность, адаптивность, продуктивность.