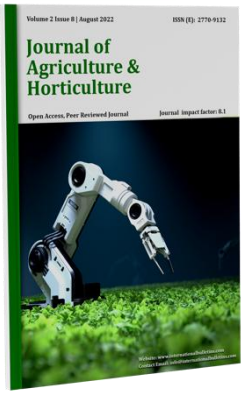

THE EFFECT OF GROWTH-REGULATING SUBSTANCES ON THE ASSIMILATORY SURFACE OF TABLE GRAPE VARIETIES.

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Abstract. This study investigates the effect of the growth regulator **Falgron** at different concentrations on the assimilating surface of leaves in table grape varieties — *Khusaine Belyi*, *Rizamat*, and *Khusaine Kelin Barmak*. The results showed that a concentration of 40 mg/l significantly enhanced leaf growth and increased the total assimilating surface area by 25–35% compared to the control. However, at 60 mg/l, a decrease in leaf growth was observed. The optimal concentration for improving vine leaf development was determined to be 40 mg/l of Falgron.

Keywords: grapevine, table varieties, assimilating surface, Falgron, growth regulator, leaf area, photosynthesis.

Introduction in recent years, the use of growth-regulating substances has become widespread in the grape-growing sector to achieve high yields and improved quality in table grape production. In grapevine plants, the development of the assimilatory surface is one of the key factors determining the efficiency of the photosynthesis process. [3; 351-б.]. The size and activity of the assimilatory surface depend on the plant's nutritional status, the number and shape of leaves, and their pigment content, all of which have a direct effect on grape yield. [5; 6.].. At the same time, according to the Resolution of the President of the Republic of Uzbekistan No. PQ–260 dated August 3, 2023 — *"On measures aimed at further developing the viticulture and winemaking industry in 2023–2026"* — a number of important tasks have been identified, such as establishing new vineyards and organizing grape plantations based on the "Oltiariq experience."

The resolution envisages the establishment of grape plantations covering **2–2.5 thousand hectares each** in **51 districts and cities** based on the "Oltiariq experience.". PR–According to **Presidential Resolution No. 5200 dated July 28, 2021** — *"On additional measures to introduce the cluster system in the development of viticulture and to support the attraction of advanced technologies to the sector"* — it is stated that vineyards covering nearly **106 thousand hectares** have been established in **48 districts specializing in viticulture**. The resolution also outlines measures related to the development of **seedless (table) grape varieties**, the introduction of **advanced technologies**, and the implementation of the **clustering system** in the industry. [1; 2;.].

The proper use of growth-regulating substances activates the physiological processes of the plant, increases the green leaf mass, and accelerates the accumulation of photosynthetic products [7, 8, 9]. Therefore, optimizing the assimilatory surface of table grape varieties and determining the effective dosage of growth-regulating substances is a pressing issue in modern viticulture science. The objects of the study were the table grape varieties *Rizamat*, *Khusayni Kelin barmaq*, and *Khusayne Belyi*.

The subject of the study was the effect of growth-regulating substances (gibberellin, indole-3-acetic acid, epin, and others) on the leaf apparatus of the grapevine, the assimilatory surface, photosynthesis intensity, and yield indicators. **Objective of the study** — to determine the optimal dosages of growth-regulating substances in table grape varieties and to evaluate their effect on the assimilatory surface of the grapevine and the overall development of the plant.

Tasks of the study

- To apply different concentrations of growth-regulating substances to table grape varieties in the experimental field.
- To measure the number of leaves, leaf area, and assimilatory activity of the grapevine.
- To recommend the most effective type and concentration of the substance.

According to the results of the study, the number of leaves and the total assimilatory surface of the grape varieties *Khusayne Belyi*, *Rizamat*, and *Khusayne Kelin Barmak* were found to be directly dependent on the amount of the growth-regulating substance **Falgron** applied. The data were analyzed by comparing them with the control treatment, in which plants were treated with water. In the Khusayne Belyi variety, under the control treatment (water application), there was an average of 15.7 leaves per shoot, 699 leaves per vine, with an average leaf area of 209 cm^2, resulting in a total assimilatory surface of 14.6 m^2.

When Falgron was applied at a concentration of 20 mg/L, the number and area of leaves slightly increased, and the total assimilatory surface reached 14.9 m^2. The highest results were observed at a concentration of 40 mg/L, with 896 leaves per vine, an average leaf area of 187.4 cm^2, and a total assimilatory surface of 16.8 m^2, which is 14.9% higher than the control. At a concentration of 60 mg/L, although the leaf area slightly increased, the total assimilatory surface decreased to 14.7 m^2, indicating that an excessive dose negatively affects plant physiology.

Table

Assimilatory surface of grapevine shoots of table grape varieties

№	Treatments	Average number of leaves per shoot, pcs	Average number of leaves per vine, pcs	Average leaf area, cm^2	Assimilatory surface of vine, m^2
	Khusayne Belyi variety				
1	Water-treated (control)	15,7	699,0	209,0	14,6
2	Falgron (20 mg/L) in 10 liters of water	18,0	702,0	213,0	14,9
3	Falgron (40 mg/L) in 10 liters of water	18,4	896,0	187,4	16,8
4	Falgron (60 mg/L) in 10 liters of water	16,7	689,0	214,0	14,7
	Rizamat varienty				
1	Water-treated (control)	15,0	685,0	208,0	14,3

2	Falgron (20 mg/L) in 10 liters of water	16,0	684,0	208,0	14,3
3	Falgron (40 mg/L) in 10 liters of water	19,0	939,0	205,2	19,3
4	Falgron (60 mg/L) in 10 liters of water	16,0	685,0	211,0	14,5
	Khusayne Kelin Barmak variety				
1	Water-treated (control)	16,2	700,0	206,0	14,4
2	Falgron (20 mg/L) in 10 liters of water	16,7	690,0	216,0	14,9
3	Falgron (40 mg/L) in 10 liters of water	20,0	950,0	190,2	18,1
4	Falgron (60 mg/L) in 10 liters of water	16,5	711,0	208,0	14,8

A similar pattern was observed in the *Rizamat* variety. Under the control treatment, the assimilatory surface was **14.3 m²**, and no significant changes were observed at **20 mg/L**. However, at a concentration of **40 mg/L**, the number of leaves reached **939**, the average leaf area was **205.2 cm²**, and the total assimilatory surface increased to **19.3 m²**. This result is **34.9% higher than the control**, indicating that **40 mg/L** is the optimal concentration for promoting growth in this variety. At **60 mg/L**, the assimilatory surface decreased again to **14.5 m²**.

In the *Khusayne Kelin Barmak* variety, a concentration of **40 mg/L** also proved to be the most effective. Under the control treatment, the assimilatory surface was **14.4 m²**, at **20 mg/L** it was **14.9 m²**, and at **40 mg/L** it reached **18.1 m²**, which is **25.6% higher than the control**. At a concentration of **60 mg/L**, the number of leaves decreased, and the assimilatory surface dropped to **14.8 m²**.

In summary, in all three table grape varieties, a 40 mg/L concentration of Falgron increased both the number of leaves and the assimilatory surface, leading to enhanced photosynthetic activity. Conversely, the higher concentration (60 mg/L) negatively affected the physiological processes of the plants.

Conclusion

As a result of the conducted studies, it was found that in the table grape varieties — *Khusayne Belyi*, *Rizamat*, and *Khusayne Kelin Barmak* — the number of leaves, average leaf area, and total assimilatory surface are significantly influenced by the application of the growth-regulating substance Falgron.

According to the experimental data:

- A **40 mg/L** concentration of Falgron stimulated leaf growth in all studied varieties, increasing the total assimilatory surface of the vines by **25–35%**.
- Compared to the control treatment (water-treated), this concentration (**40 mg/L**) resulted in the maximum increase in leaf number and leaf area, while also creating optimal conditions for photosynthetic activity.
- A higher concentration of Falgron (**60 mg/L**) in some cases slowed leaf growth and led to a decrease in the assimilatory surface.

- The highest total assimilatory surface was observed in the *Rizamat* variety (**19.3 m²**), indicating a high potential for intensive growth and yield accumulation.

Overall, it was demonstrated that a **40 mg/L** concentration of Falgron is the most effective in increasing leaf biomass and the assimilatory surface in table grape varieties.

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