

# FEATURES OF LAYING VINEYARDS IN PERSONAL FARMS IN THE SOUTH OF UKRAINE

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## Abstract

The article presents data on the establishment of vineyards by table varieties in the farm, as well as their growth and development in the south of Ukraine. As a result of research, their development of vegetative mass (length, diameter of shoots and number of leaves), root system and percentage of seedling survival was analyzed.

**Keywords:** *grape, biometric indicators, weight of the bunch, leaf area, roots, harvest of bush.*

## Introduction

Viticulture is one of the branches of agricultural production, which despite a number of unfavorable economic factors of the country's development and structural changes in the process of reforming the agricultural sector has not lost its investment attractiveness and remains one of the promising areas of business for small and medium farms. As a component of the agro-industrial complex of Ukraine, viticulture is of great economic importance, due to the valuable nutritional and health properties of fresh grapes and products derived from it, the unpretentiousness of grapes to the soil and its reclamation role in the development of slopes and slopes, unsuitable for other crops and high enough economic efficiency. However, along with these advantages, in the current conditions there is a situation with a decrease in the area of vineyards occupied by technical varieties of grapes, which is primarily due to the closure of such a market for wine materials as the Russian Federation, although domestic conditions, on the contrary contribute to the development of viticulture and winemaking in general.

From the standpoint of marketing research, grapes should be considered as a food product along with other foods that may act on the market as its competitors or substitute products [1, 3, 4].

The scientifically substantiated consumption rate of fresh grapes per person is 8-10 kg per year. In fact, Ukraine consumes 10 times less and is much lower than the level of consumption in other countries (Greece -16 kg, Spain -9.7 kg, Great Britain -9.6 kg, Switzerland -6 kg, France -4.3 kg, USA- 2.8 kg) [2, 5].

Accordingly, the establishment of vineyards by table varieties today is a very relevant and promising topic. But before planting such plantations, in turn, it is necessary to select the soil and climatic conditions and market demand varieties of table grapes that would fully meet these requirements.

### **Purpose**

The purpose of our research is to create a high-yielding array of table grape varieties on an area of 10 hectares, a selecting of grape varieties based on the prepared part of the project documentation, which characterized the area: the site and its agro-climatic conditions.

### **Materials and methods of research**

Field experiment was carried out in farm "Demetra", v. Fedorivka, the Berezansky area of the Nikolaev region. The object of research is grape varieties Arkadiya (control), Liviya, Preobrazheniye.

The experiment is embed of three repetitions, in each variant of 45 accounting bushes - 15 in one repetition. The total area of the plot with protective rows is 1 hectare. The general agrotechnical care on the experimental site was performed in accordance with the recommendations for this agroclimatic zone within the first year of vegetation, considering the climatic features of the current year. Soil retention - black steam. Rootstock Berlandieri x Riparia Kobera 5BB.

### **Results and discussion**

As result of research, we found that the conditions of the winter-spring period 2019-2020 were in terms of temperature very favorable for the establishment of vineyards since the first decade of April.

The layout of the vines was 3 x 1.6 m. Planting of grapes was carried out in planting holes under the digger, the depth of planting holes is 50 cm.

Before planting, the seedlings were prepared according to the accepted technology, soaked in a solution to which "Biochelat" was added, and the sections were renewed.

**Table 3.1.** Survival of varieties in a permanent place as on November 1, 2020

Variant	Area, ha	Number of planted plants, pcs.	Number of plants that took root, pcs.	Survival, %	The required number of seedlings for repair, pcs.
<i>Arkadiya (control)</i>	0,95	1984	1828	92	156+10%
<i>Liviya</i>	1,1	2332	2053	88	279+10%
<i>Preobrazheniye</i>	0,95	1984	1781	89,7	203+10%

One of the most important analyzes in the year of planting is the analysis of seedling survival (Table 3.1), because the final costs and the rate of entry of plantations into fruiting depend on this indicator. Immediately after planting, a drip-feeding system was installed, so the survival rate by varieties in the laid area is quite high.

Analyzing table 3.1. we see that the highest survival rate was obtained in the variety Arkadiya, which accounted for 92% of plants, slightly lower and approximately the same was the survival rate in the varieties Liviya and Preobrazheniye 88 and 89.7%, respectively. Therefore, after the inventory, in November, the plants were planted. It should be noted that the good survival of seedlings indicates their high quality and optimal climatic conditions during the growing season, as the plants that developed from these seedlings (in the first year of the growing season) were aligned in development, formed a good one-year growth that fully matured. in the future it will allow us to form a bilateral horizontal border quickly enough.

Regarding the biometric indicators of plants, in the first year of the growing season, the number of developed shoots on the bushes, their length, diameter and the number of leaves they formed were recorded. Arkadiya grape variety was conditionally taken as a control - as one that is zoned and the most common in the vineyards, which is confirmed by the data of the Grape Cadastre.

Analyzing the development of biometric indicators (Table 3.2), namely the number of shoots per bush, all varieties formed approximately the same number of shoots, the largest was in the variety Preobrazheniye, and in the varieties Liviya and Arkadiya the number of shoots was the same 2.8 shoots per bush. However, it should be not that the leaf surface area and the volume of annual growth varieties differed from each other.

**Table 3.2.** Biometric indicators of development of grape bushes of a grade in a year of planting

Variant	Number of shoots on the bush, pcs.	The number of leaves on the shoot, pcs.	The area of the leaf surface of the bush, m <sup>2</sup>	Shoot length, cm	Shoot diameter, cm	Annual growth volume, cm <sup>3</sup>
<i>Arkadiya (control)</i>	2,8	8,5	0,13	93	0,51	53,23
<i>Liviya</i>	2,8	9,4	0,21	90	0,53	55,58
<i>Preobrazheniye</i>	3,1	8	0,12	98	0,48	54,94
SSD <sub>05</sub>			0,09			0,76

\*SSD<sub>05</sub> - The smallest significant difference

The increase in the leaf surface area of the bush was significant compared to the control in the variety *Liviya*, and in the variety *Preobrazheniye* it was within the experimental error, as it did not exceed  $SSD_{05} = 0.09 \text{ m}^2$  due to the different number of leaves and their diameter. So, we see that the number of leaves in varieties is different 8.5 in the variety *Arkadiya*, 9 leaves per shoot in the variety *Liviya*, which was the best in this indicator and an average of 8 leaves per shoot in the variety *Preobrazheniye*. It should be noted that the leaf diameter of the studied varieties was also the highest in the variety *Liviya*, but the smallest in the variety *Preobrazheniye*, although due to the greater number of shoots per bush on the leaf surface area *Arkadiya* and *Preobrazheniye*, as we noted were almost the same  $0.13 \text{ m}^2$  - *Arkadiya* and  $0.12 \text{ m}^2$  - *Preobrazheniye*, due to a set of indicators of which consists of the value of the leaf surface area. The *Liviya* variety formed an average leaf surface area of the bush in the amount of  $0.21 \text{ m}^2$ .

By the diameter of the shoots, we also see differences. *Arkadiya* and *Liviya* grapes with the same number of shoots recorded diameters that differed not significantly 0.51 and 0.53 cm, respectively, less than half a centimeter, namely 0.48 cm was the average diameter of the shoots of the *Preobrazheniye* variety. However, the increments obtained by the volume of one-year growth of the bush were significant compared to the control in the varieties *Liviya* and *Preobrazheniye*, as they were 2.25 and 1.71 cm<sup>3</sup> at  $SSD_{05} - 0.76 \text{ cm}^3$ .

Thus, summing up the analysis of the development of biometric indicators of table grape varieties, we can say that the most powerful development in the conditions of our array was in the Liviya variety.

**Table 3.3.** Development of the root system in the first year after planting

Variant	The diameter of the roots	Amount of roots, pcs	Root length, cm
<i>Arkadiya (control)</i>	up to 1 mm	12,4	5,8
	1-3 mm	4,8	8,3
	3-5 mm	-	-
<i>Liviya</i>	up to 1 mm	12	6,6
	1-3 mm	8,7	9,2
	3-5 mm	-	-
<i>Preobrazheniye</i>	up to 1 mm	13,5	5,1
	1-3 mm	11,6	10,8
	3-5 mm	0,4	7,2

A complete description of the state of plant development, the first year of the growing season, should be made not only on the basis of the assessment of the aboveground part of the bush, but also the development of the root system, which correlate with each other.

Analyzing table 3.3, it should be noted that the variety Preobrazheniye formed in contrast to the varieties Arkadiya and Liviya roots with a diameter of 3-5 mm, but the other varieties of this fraction did not have. In the first year of vegetation, all found roots that were measured in diameter and length were in the soil layer 40-60 cm.

Thus, the total length of roots in Arcadia was the smallest in the experiment; the average was in Libya and the largest in Transfiguration. This is due, to the fact that there is a mutual influence of the components of the grafted plant on each other, ie not only the rootstock affects the development of the plant, but also the rootstock exerts its influence. In our case, according to the characteristics, the Transfiguration variety is the most vigorous and prone to the formation of stepsons, due to this it has provided a stronger development of the root system, which in the next year of vegetation will allow it to develop more intensively than the other two varieties.

## Conclusions

Based on the accounting, observations and analysis of research conducted in 2020-2021, we can conclude that the bushes are well developed, the selected protection system is correct, and the preparatory work carried out before laying was carried out in a timely manner, as we have a significant degree of survival and good development of above-ground and underground parts of table grape bushes.

Accordingly, in order to establish a in a short time highly productive vineyard, you need to carefully prepare all project documentation and select a site with optimal conditions for growth and development of vineyards.

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