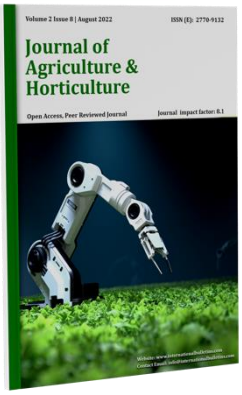

THE EFFECT OF PLANTING SCHEMES ON THE YIELD AND QUALITY INDICATORS OF THE PARKENT GRAPE VARIETY

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Abstract: in the article, the results of research conducted to study the effect of planting schemes on the yield and quality indicators of the Parkent variety of grape are presented with a deep scientific analysis. Also, the effect of the planting scheme on the chemical composition of grape juice is described.

Key words: varieties, productivity, quality indicators, chemical composition, bunch, planting scheme, juice.

Introduction

Vine bushes are very sensitive to the agrotechnics used and its variability. Differences in their growth and development were observed when Husayni and Taifi rozovy grape varieties were planted in 3x2 m plots and grown at different body heights (80-120 cm). Body height had a positive effect on the growth and productivity of grapevine bushes, where the average length of branches was 67.4-68.1 cm when the body height was 80 cm and the number of branches per bush was 32.7 to 36.8 piece. In bushes with a body of 120 cm, the average length of the branches reached 68.6-69.0 cm. Ripeness of branches was 63.8-65.1% and 66.8-70.0% respectively [5].

Materials and Methods

In this experiment, the local universal variety of grape Parkent, which was used in the previous experiment, served as a research object. Observations and biometric measurements were carried out in vineyards established in different schemes based on this grape variety. Depending on the planting schemes, the effect on the productivity and quality indicators of vine bushes was determined.

The cultivars studied in the experiment were grown with a short-bodied claw-like shape in the vineyards. The bush load is 120 eyes in all experience options.

Results and Discussion

It is known that planting schemes are one of the agrobiological factors that have a significant impact on the productivity of vines and the yield per unit area. After all, when the planting scheme is changed, the feeding area of the bushes can change in one direction or another, as a result of which the competition for food in the unit area can increase or, on the contrary, decrease. Our observations showed that the planting scheme had a significant effect on the total number of grape heads on the vines. In this case, the highest amount of grapes on the bush compared to the control was determined in the vineyards established in the scheme of 3.0 x 3.0 m and 3.0 x 3.5 m.

In these experimental options, the total number of grape heads formed on the bushes of the local Parkent variety of grape reached 60.6 and 59.2 units, respectively. This means 6.9 and 5.5 times more than this indicator of the control option, respectively. Compared to the

control, the least number of vines formed in bushes was recorded in the vineyards established in the scheme of 3.0 x 2.0 m. In this experimental option, the average number of grape heads formed per bush did not exceed 46.6 units, which means 6.1 units less than this indicator of the control option.

The planting pattern also had a significant effect on the average weight of grape heads. Compared to the control option (361.4 g), the largest grape heads were recorded in the vineyards planted in the 3.0 x 3.5 m scheme. The average weight of the grape heads formed in this experimental option reached 450.8 g. This means that the control option is 91.4 g heavier than the average weight of grape heads. In the experiment, the average weight of the grape heads formed in the bushes of the vineyards established in the scheme of 3.0 x 3.0 m was higher than that of the control option. In this experimental option, the average weight of one grape head was 435.6 g, or 74.2 g heavier than this indicator of the control option.

Compared to the control option, the smallest grape heads were recorded in the vineyards established in the scheme of 3.0 x 2.0 m. The average weight of the grape heads formed in this experimental option did not exceed 315.6 g. This means that the control option is 45.8 g less than the average weight of grape heads (see Table 1).

Table 1

The influence of the planting scheme on the productivity of the local Parkent grape variety (2021-2023)

Planting scheme	Bush load	Feeding area of one bush, m^2	The number of grape heads on the bush, pieces;	Average weight of grape head, g;	Average yield of the bush, kg;
3,0 x 2,0	120	6,0	46,6	315,6	14,7
3,0 x 2,5 – con.	120	7,5	53,7	361,4	19,4
3,0 x 3,0	120	9,0	59,2	435,6	25,8
3,0 x 3,5	120	10,5	60,6	450,8	27,3

The data of this table shows that in the vineyards planted in different schemes, that is, when the feeding area of the bushes changed, the average productivity of the bush, depending on the average number of grape heads per bush and the average weight of one grape head, also differed. Compared to the average productivity of bushes in the control option (19.4 kg), the highest yield was recorded in the vineyards established in the scheme of 3.0 x 3.5 m. In this experimental option, the average productivity of one bush reached about 27.3 kg. This is 7.9 kg higher than the average yield of the control option bushes. In the experiment, the average productivity of vine bushes established in the scheme of 3.0 x 3.0 m was higher than the control option. In this experimental option, the average yield per bush reached 25.8 kg, or 6.4 kg higher than this indicator of the control option.

Compared to the control option, the lowest average yield per bush was recorded in the vineyards planted in the 3.0 x 2.0 m scheme. In this experimental option, the average yield of bushes did not exceed 14.7 k g. This means 4.7 kg less than the average productivity of the control option bushes. In this experimental option, the average number and average weight of grape heads formed on each bush, as well as the lowest average yield per bush, we believe, are

explained by the feeding area of the bush. Because in this experimental option, the feeding area of each bush is the smallest, i.e. 6.0 m^2, which is 1.5 m^2 smaller than the feeding area of the control option bushes.

It should be noted that in different planting schemes, the number of plants per unit area is different, so their yield per unit area may have a different expression. Because, in addition to the average number of grape heads per bush, the average weight of one grape head and the average productivity of the bushes, the factor such as the number of plants per unit area also has its influence.

In our experiments, the theoretical yield indicators obtained by multiplying the average yield from each bush by the number of plants per unit area clearly proved the above point. Although the average number of grape heads per bush, average weight of one grape head, and average productivity of bushes were recorded in the vineyards planted in the 3.0 x 3.5 m plot, the highest yield per unit area was planted in the 3.0 x 3.0 m plot. was recorded in the vineyards. It can be seen that in the vineyards established in the scheme of 3.0 x 3.5 m, the coefficient of utilization of the feeding area of each bush is lower than in this scheme. So, compared to the control option, the highest yield was obtained in vineyards planted in a 3.0 x 3.0 m scheme. In this experiment, the yield per unit area reached 286.6 quintals, or 28 quintals higher than the yield obtained in the control option (258.6 ts) on average.

An increase in yield compared to the control, although insignificant, was also found in the vineyards established in the 3.0 x 3.5 m scheme. In this experimental option, the average yield per unit of area reached 259.9 tons, or 1.3 tons higher than this indicator of the control option. It can be seen that in this experimental option, the average number of grape heads per bush, the average weight of one grape head and the average productivity of the bunches were at the highest values, but the yield per unit area was almost the same as the control option.

Compared to the control option, the lowest yield was obtained in the vineyards established in the scheme of 3.0 x 2.0 m. In this experiment, the yield per unit area did not exceed 245.1 centners, or it was 13.5 centners lower than the yield obtained in the control option (258.6 tons).

It should be noted that the quality of wine, the amount of output in relation to raw materials and the efficiency of the wine industry directly depend on the mechanical composition and properties of raw materials - grapes. A number of researchers say that thorough knowledge of the mechanical composition and characteristics of the grape head and stem of the grape variety brought to obtain primary wine determines the efficiency of further technological processes. After all, the grape juice extracted for wine is released in different quantity and quality directly depending on the mechanical composition of the grape bunch. Planting schemes have a significant impact on the quality of raw materials, that is, on the mechanical structure of the grape head. Because, when the planting scheme is changed, the nutrition area of the plant also changes, and only bushes with a moderate nutrition area can provide such quality raw materials.

Our observations showed that as the feeding area increased, the amount of hard parts in the skin and flesh of the grape bunch also decreased. In this case, the smallest value of this indicator compared to the control was determined in the vineyards established in the scheme of 3.0 x 3.0 and 3.0 x 3.5 m. In these experimental options, the amount of solids in the skin and flesh of the grape bunch was 20.4 and 20.9%, respectively. This means 1.9 and 1.4% less than this indicator of the control option. This situation can be explained by the formation of the

largest bunchs due to the width of the feeding area (9.0 and 10.5 m^2) in vineyards established in the scheme of 3.0 x 3.0 and 3.0 x 3.5 m. In experimental options with a smaller feeding area, a significant crushing of the bunchs was observed. Consequently, the amount of hard parts in the skin and flesh of the grape bunch in the vineyards established in the scheme of 3.0 x 2.0 m reached almost 24.6%. This is 2.3% more than that of the control option (see Table 2).

Table 2
The influence of the planting scheme on the mechanical composition of local Parkent variety of grape (2021-2023)

Planting scheme	Grape head		Mechanical composition of the grape head, %			
	weight, g	size, cm	band	skin and meat	seed	juice
3,0 x 2,0	315,6	22,5x10,1	1,5	24,6	1,6	72,3
3,0 x 2,5 – con.	361,4	23,9x10,6	1,6	22,3	1,7	74,4
3,0 x 3,0	435,6	24,3x11,7	1,8	20,4	1,7	76,1
3,0 x 3,5	450,8	26,1x12,4	1,8	20,9	1,8	75,5

The data in this table show that the mechanical composition of the grape head and the percentage of seeds differed, albeit insignificantly, depending on the planting scheme. In this case, as the feeding area increased, large grape heads were formed, and in the vineyards established in large schemes (3.0 x 3.0 and 3.0 x 3.5 m), the number of bunches and seeds in the grape heads was relatively larger. But when this size is taken in relation to the formed grape head itself, their share is less than that of small schemes.

This situation was clearly proven when measuring the amount of juice obtained from grape heads in each experimental option. Consequently, the highest yield of grapes was obtained from vines planted in 3.0 x 3.0 and 3.0 x 3.5 m plots. In these experimental options, the percentage of juice in the mechanical composition of grape heads (obtained in a laboratory press) was 76.1 and 75.5%, respectively. At this time, the amount of juice obtained from grape heads in the control option was 74.4%, and the superiority of the above experimental options was between 1.7 and 1.1%, respectively.

Compared to the control, the least amount of juice from the grape heads was determined in the vineyards planted in 3.0 x 2.0 m schemes. In this experimental option, the percentage of juice in the mechanical composition of grapes did not exceed 72.3%. This is 2.1% less than this indicator of the control option. This situation can be explained by the small size of the grape heads and bunches due to the small feeding area in the vineyards planted in 3.0 x 2.0 m plots and its influence on the reduction of the percentage of juice.

It is known that the local Parkent variety of grape is a universal variety, that is, forage and technical. But due to its good coloration in the mountainous hills of the Parkent region (it does not get a good color in the plain regions and the bunchs are crushed), its bunchs are even from dark pink to crimson dark pink, it is grown here for more technical purposes (juice and wine). The amount of total sugars and organic acids in the grape bunch is of great importance in the production technology of high-quality juice and wine material from technical varieties of grapes. After all, these indicators are one of the main criteria for determining which grapes can be used to make juice or which type of wine. For example, in the technology of

winemaking, alcohol fermentation of sugar takes place in order to produce wine, so technical grape varieties with high sugar content are of high importance.

Laboratory analysis of grape juice obtained depending on the planting scheme showed that the highest sugar content was found in bunchs of grape heads in vineyards planted in 3.0 x 3.0 and 3.0 x 3.5 m schemes. In these experimental options, the total sugar content (areometric) of grape juice was 23.1 and 22.5%, respectively. At this time, the sugar content of the juice obtained from the bunches of grape heads in the control option was around 21.9%. Thus, the sugar content of the grape juice of the mentioned experimental options was higher by 1.2 and 0.6%, respectively, compared to the control.

Compared to the control, the lowest expression of gujum juice sugar content was determined in the harvest of vineyards established in 3.0 x 2.0 m schemes. In this experimental option, the sugar content of gujum juice did not exceed 20.8%. This is 1.1% less than the control option.

Here, it is worth noting that in the vineyards planted in 3.0 x 2.0 m plots, the sugar content of the grape juice was below control, and the ripening of the crop was delayed by 5-7 days to reach this condition. In our opinion, this situation can be explained by the competition for the nutrient balance in densely planted vineyards and by the fact that the vineyard becomes sparse due to the abundance of bushes.

It is known that in winemaking technology, along with the sugar content of gujum juice, its total acidity is also an important technological indicator. The acidity of the juice of the bunchs of the Parkent variety of grape planted in different schemes also differed depending on the feeding area.

Based on our observations, the data of the above picture showed that the total acidity did not change in the experimental options where the feeding area was increased compared to the control, and remained at the level of the control option (5.4-5.5 g/l). The acidity of the juice of the bunch of grapes of the experimental option planted only with density was slightly higher than the control and reached 5.9 g/l. This is 0.4 g/l higher than that of the control option.

Conclusions

The highest amount of grapes on the bush compared to the control (53.7 heads) was determined in the vineyards established in the scheme of 3.0 x 3.0 m and 3.0 x 3.5 m. In these experimental options, the total number of grape heads formed on the bushes of the local Parkent variety of grape reaches 60.6 and 59.2 units, respectively. The lowest number of vines was recorded in vineyards planted in a 3.0 x 2.0 m scheme and did not exceed 46.6 units on average. The planting pattern also had a significant effect on the average weight of grape heads. Compared to the control option (361.4 g), the largest grape heads were recorded in the vineyards established in the 3.0 x 3.5 m and 3.0 x 3.5 m schemes. The average weight of grape heads formed in these experimental options reached 450.8 g and 435.6 g, respectively. The smallest grapes with an average weight of 315.6 g were recorded in the vineyards planted in the 3.0 x 2.0 m scheme. The highest yield from each bush compared to the control version (19.4 kg) was recorded in vineyards planted in 3.0 x 3.5 m and 3.0 x 3.5 m layouts.

In these experimental options, the average productivity of one bush reached 27.3 and 25.8 kg, respectively. The lowest average yield was recorded in vineyards established in the scheme of 3.0 x 2.0 m, and it did not exceed 14.7 kg/bush. As the nutritional area increased, the amount of solids in the skin and flesh of the grape bunch also decreased. In this case, the smallest

value of this indicator compared to the control was determined in the vineyards planted in the scheme of 3.0 x 3.0 and 3.0 x 3.5 m and was 20.4 and 20.9%, respectively. In the 3.0 x 2.0 m scheme, this technological indicator reached 24.6%. This is 2.3% more than this indicator of the control option (22.3%).

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