



The Dependence of Grape Feeding on the Productivity Indicator and Harvest Quality of Rizamat and Large Dry Varieties

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Article History	Abstract
Received: 13 June 2023 Revised: 12 September 2023 Accepted: 21 September 2023 CC License CC-BY-NC-SA 4.0	<p>After forming the vines, one of the agrotechniques is khometok, which protects the vines from diseases and has a positive effect on the chemical composition of the grape cluster. The process of pruning vines from 0.25% barren branches to 100% barren branches was observed. The best result was distinguished by good chemical composition and productivity indicators of grape bunches on vines with 50% barren branches.</p> <p>Keywords: stem, root, vine bush, stem, bud, variety, leaf, cluster, acidity, sugar, productive, non-productive, productivity.</p>

1. Introduction.

Khomtok is a continuation of autumn and spring pruning. It helps to give the necessary shape to the vine bush, to place the branches evenly on the branches and stems, as well as the growth and development of the bush, nutrition, normal physiological processes, good pollination of flowers and fruit formation. Therefore, khumtok is one of the most important and responsible agrotechnical events held in spring and summer. Harvested branches left on vine bushes cut in autumn and spring are identified and nurtured mainly during winter. When mulching, the nutrients from the leaves and roots are spent on the crop, the development of the fruiting branches and their good ripening. A vine that has been pruned makes efficient use of air, light, and heat, and is especially susceptible to fungal diseases.

In Uzbekistan, there are cases of underdevelopment of buds and numerous occurrences of unfruitful (male) branches in the varieties of vines grown in the conditions of Uzbekistan. The ability of khoraki and kishmishbop varieties to bear fruit is lower than that of vinobop varieties. Unfruitful, slow-growing, unnecessary branches are removed in the process of homing. As a result, the growth and development of the branches accelerates, the flowers are well pollinated, many buds form on the branches, and the ground is created for an abundant harvest next year [1].

With the appearance of galls on the vine, it is possible to distinguish fruitful branches from unfruitful ones and remove the excess. When the length of the branches reaches 40-45 cm, they are tied to the cypress. If curls appear instead of flowers, this branch will be barren. Early pruning of branches that are clearly non-productive will promote the development of

additional branches, including bearing ones. It is not recommended to remove too many branches during the harvest. This causes the weakening of the above-ground part of the bush and the root system, the reduction of the leaf area, the violation of the balance between the growth and development of the above-ground and below-ground parts of the plant [2].

Khomtok is mainly conducted in two stages, the first is called "shora khamtok" and the second is called "ghora khamtok". Shura khomtok is planted in late April and early May when fruitful and unfruitful branches are identified. During this period, new green shoots will produce the first curls of 25-30 cm. During the ripening period, grape vines increase in size, their bands become stronger, and the vines do not spill out [3].

Researchers have different opinions about the role of barren branches and the size of their pruning. Barren branches can reduce the yield by wasting a lot of moisture and thickening the bush, but they are considered necessary when the branches are underdeveloped. He recommended leaving a large supply of buds in the fall, and removing all unfruitful ones during pruning. He assumed that productive branches are fed at the expense of unproductive ones. Therefore, annual cutting of unproductive branches reduces the vegetative and generative power of the bushes [5].

2. The Methods of Research.

Determination of productivity indicators, i.e. calculation of undeveloped shoots, fruitless and productive (1 and 2 grape heads) branches V.F. Moiseychenko [9; 21–28 p.] was performed according to the style.

Determination of bud growth. The total amount left in one branch, the number of sprouts in one branch and their location in the branches, the number of sprouts and sprouts, the ratio of sprouts to the total number of sprouts in a branch were determined in percentage. These calculations were carried out on April 8-15, when new branches were 7-10 cm long. Identification of annual branches. The number of fruitful new branches in the counted branches was determined by separating them from non-productive branches. The productivity of the branches and the productivity coefficient of the branch were determined by the generally accepted method.

Calculations were carried out on April 20-30, before cutting the unfruitful varieties, and on June 10-15, after the flowering of the grapes.

Determination of the chemical composition of grape juice. Mechanical analysis of the composition of the grape head by Professor A.N. It was carried out based on the method recommended by Prostoserdov and generally accepted methods in viticulture.

To analyze the mechanical structure of the grape head, 5 grape heads specific to the variety were taken, the weight of each grape head was weighed on a scale (g), the number of bunches in each grape head was counted (pieces), the total weight of the bunches in the grape head was weighed (g), the weight of the shingle was determined. (g), find the ratio of bunches and shingles per grape head (% of the total weight of the grape head).

To determine the weight of gujum skin, seeds and juice, the obtained gujums are placed in a cloth bag (preferably gray cloth) and the juice is squeezed out of it. The residue left in the bag is poured onto a filter paper, the seed is separated from it and weighed on a balance. Then the weight of the remaining skin and meat is weighed. To find juice weight, rudiment seed and husk weight is subtracted from the mass weight.

The sugar content of gujum juice was determined with a hydrometer indicating the specific gravity of the juice.

In the determination of acidity, it was determined using the titration method in 0.1 N alkali solution (NaON) with the addition of phenolphthalein as an indicator to grape juice.

3. Results of the Research:

In 2018-2020, experiments, theoretical and practical studies were conducted at the Department of Fruit and Viticulture of the Tashkent State Agrarian University and at the Karima Muruvvat Agro farm, established in 2009, located in the Tashkent district of the Tashkent region. Laboratory analyzes were analyzed at the scientific research institute of horticulture, viticulture and winemaking named after Academician M. Mirzaev. Apart from these, in determining the productivity of the vine bush, its productivity coefficient and the productivity of the branches are the most important varietal characteristics. It should be noted that agrotechnical conditions, in particular, are an important factor that has a high impact on the actual productivity of grape varieties. The results of the experiment on the study of the effect of humus on the yield indicators of grape varieties showed that the following indicators were obtained when studying the effect of humus on productive branches in Rizamat variety of grape. It was found that the number of single bearing branches was 30.0%, the number of double bearing branches was 6.0% and the total number of bearing branches was 36.0%. When 50% fruitless branches of the vine were pruned, it was noted that one-fruited branches were 2.3% higher than the control option, two-fruited branches were 1.3% higher, and total-fruited branches were 3.6% higher. When 75% barren branches were pruned in the vine bush, it was observed that one bearing branch was 0.6%, two bearing branches 0.8% higher and total bearing branches 1.4% higher than the control option. It was found that when the vine bush was 100% raw, the number of one-fruited branches was 1.8% less than the control variant, the number of two-fruited branches was 0.3% more, and the total number of fruitful branches was 1.5% less. The following indicators were obtained when studying the influence of the rate of humming on the yielding branches in the Katta Kurgon grape variety. In the control option, where 25% of the vines were barren, the number of vines per branch was 33.2%, the number of vines per two fruitful branches was 6.4%, and the total number of fruitful branches was 39.6%. When 50% fruitless branches of the vine were pruned, single-bearing branches were 2.3% higher, double-bearing branches were 0.3%, and total bearing branches were 2.6% higher than the control variant.

Table 1. The effect of the Khomtok norm on the indicators of yielding branches of grape varieties, 2018-2020

of grape varieties, 2018-2020						
N	Variant	In % of fertile branches			The number of grape heads on a harvested vine	The number of grape heads per stem
		single crop	two crops	Total		
Rizamat variety 160-200 buds						
1	25% barren branches were harvested (control)	30,0	6,0	36,0	1,2	0,4
2	50% barren branches are cut	33,0	7,9	40,9	1,2	0,5
3	75% of barren branches are cut	31,9	7,1	39,0	1,2	0,4
4	100% barren branches are harvested	27,3	7,3	34,6	1,2	0,4

Big Kurgon variety 160-200 buds						
1	25% barren branches were harvested (control)	33,2	6,4	39,6	1,3	0,6
2	50% barren branches are cut	35,5	7,7	43,2	1,2	0,7
3	75% of barren branches are cut	33,8	7,2	41,0	1,3	0,6
4	100% barren branches are harvested	31,4	6,7	38,1	1,2	0,5

At 75% thinning of the vine bush, the percentage of one-fruited branches was 0.6% higher than the control variant, two-fruited branches were 0.8% higher, and total-fruited branches were 1.4% higher. It was found that when the vine bush is 100% raw, the number of one-fruited branches is 0.8% less than the control option, two-fruited branches are 0.3% more, and the total number of fruitful branches is 1.5% less (Table 1).

When the chemical composition of grape pomace of Rizamat variety was studied, it had the following parameters. Sugar content was 19.2% higher, and acidity was 4.6 g/l less than that of the vine bush with 25% barren branches (control).

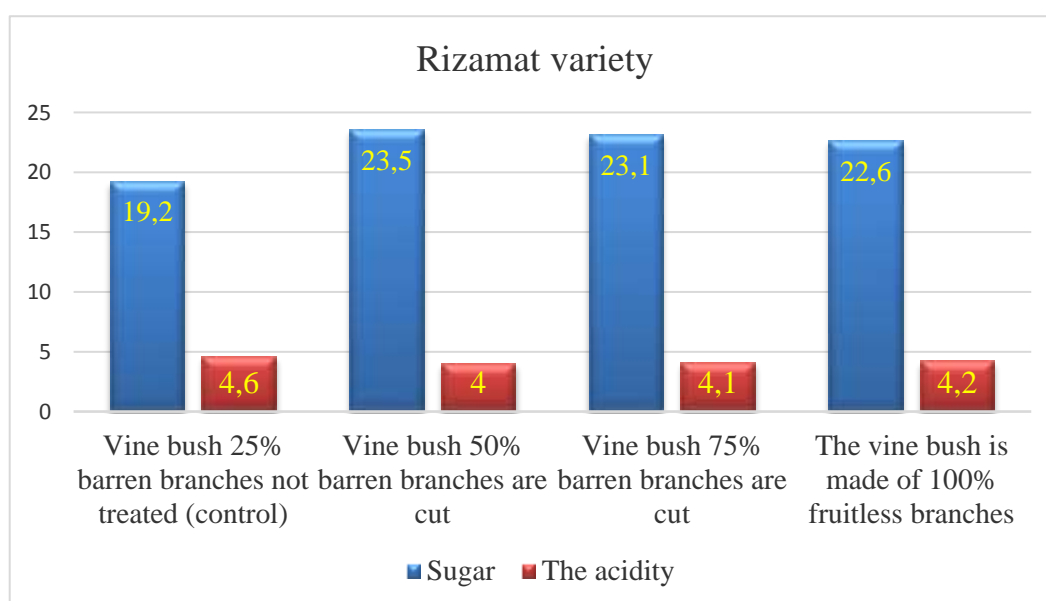


Figure 1. The dependence of the chemical composition of the Rizamat variety on the raw material, (2018-2020).

When 50% unfruitful branches of the vine bush were harvested, the sugar content was 4.3% higher than the control option, and the acidity was 0.6 g/l less. When 75% of unfruitful branches of the vine bush were pruned, the sugar content was 3.9% higher than the control option, and the acidity was 0.5 g/l lower. When 100% fruitless branches of the vine bush were harvested, the sugar content was 3.4% less than the control variant, and the acidity was 0.4 g/l less (Fig. 1).

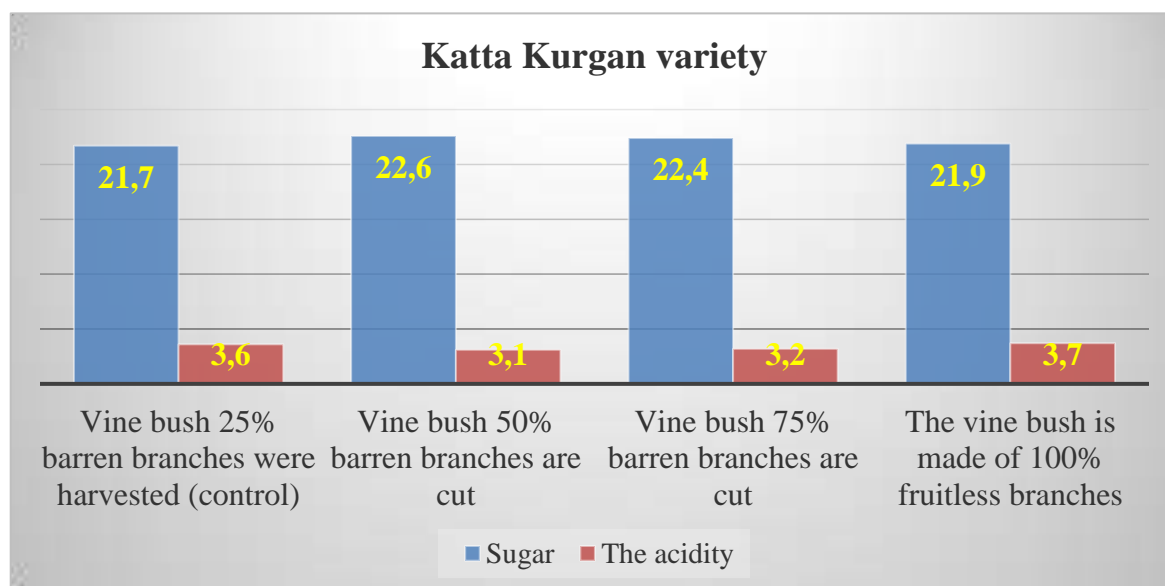


Figure 2. The dependence of the chemical composition of the Big Kurgon variety on raw materials (2018-2020).

When studying the chemical composition of grape pomace of the Katta Kurgon variety, it had the following parameters. It was noted that sugar content was 21.7%, and acidity was 3.6 g/l from the variant in which 25% of fruitless branches of the vine were harvested (Fig. 2).

When 50% unfruitful branches of the grapevine bush were pruned, the sugar content was 0.9% higher than the control variant, and the acidity was 0.5 g/l less. When 75% unfruitful branches of the vine were pruned, the sugar content was 0.7% higher than the control option, and the acidity was 0.4 g/l lower. When 100% fruitless branches of the vine bush were harvested, the sugar content was 0.7% less than the control variant, and the acidity was 0.1 g/l more.

The agrotechnical measures performed in the green part of the vine bush, including the rules of pruning, had a significant effect on the yield of grape varieties, in particular, the number of grape heads on the bush and their average weight. According to the results of the experiment, it was observed that the weight of the grape head is 380.4 g, the yield per bush is 14.4 kg, and the yield is 159.9 t/ha. When 50% unfruitful branches of the grapevine were pruned, the weight of the grape head was 40.1 g, the yield per bush was 3.2 kg, and the yield was 34.6 t/ha. 75% of the vine is fruitless

it was observed that the weight of the grape head was 12.2 g higher than the control variant, the yield per bush was 1.9 kg, and the yield was 21.2 t/ha when the branches were pruned. When 100% unfruitful branches of the vine were harvested, the weight of the grape head was 2.0 g less than the control option, the yield per bush was 0.3 kg less, and the yield was 3.3 t/ha less.

Table 2. The influence of the rate of raw materials on the yield of grape varieties, 2018-2020

N	Options	Average weight of grape head, year	Yield per bush, kg	Productivity, ts/ha
Rizamat variety 160-200 buds				
1	25% barren branches were	380,4	14,4	159,9

	harvested (control)			
2	50% barren branches are cut	420,5	17,6	195,5
3	75% of barren branches are cut	392,6	16,3	181,1
4	100% barren branches are harvested	378,4	14,1	156,6
	EKF ₀₅	3,1	0,5	1,6
	Sx	0,4	0,08	0,26
Big Kurgon variety 160-200 buds				
1	25% barren branches were harvested (control)	444,3	15,7	174,4
2	50% barren branches are cut	448,6	17,9	198,8
3	75% of barren branches are cut	435,7	16,8	186,6
4	100% barren branches are harvested	431,1	15,8	175,5
	EKF ₀₅	3,3	0,5	5,4
	Sx	0,51	0,51	0,90

The weight of the grape head was 444.3 g, the yield per bush was 15.7 kg, and the yield was 174.4 t/ha. when unfruitful branches were pruned, the weight of the grape head was 4.3 g higher than that of the control variant, the yield on the bush was 2.2 kg, and the yield was 24.4 t/ha. When 75% fruitless branches of the vine were pruned, the weight of the grape head was 8.7 g less than the control variant, the yield per bush was 1.1 kg more, and the yield was 12.2 t/ha higher. When 100% unfruitful branches of the vine bush were pruned, the weight of the grape head was 13.2 g less than the control option, the yield on the bush was 0.1 kg more, and the yield was 1.1 t/ha higher (Table 2).

The economic efficiency of rooting of grape varieties in the cultivation of grapes by the voish method. The calculation was made based on the productivity of varieties, the state purchase prices for new products, the payment system and the payment of wages for labor accepted in farms specialized in viticulture and the costs of the agrotechnical works. According to this technological card, the total costs for crop cultivation are set at 31,115,717 soums, of which the total cultivation costs are 2,909,4334 soums, and the costs of harvesting and transporting 120 tons/ha are 2,021,383 soums.

Therefore, the cost of growing fodder varieties of grapes has changed depending on the yield obtained at different rates and the additional yield produced under the influence of this agrotechnology.

Table 3 The economic efficiency of different rates of humming grape varieties, 2018-2020

Вариант п	Harvesting expenses, thousand soums	Productivity, ts/ha	Product price, thousand soums/ts	Realization price of the product, suum	Gross income, thousand soums/ha	Net profit, thousand soums/ha	Rate of return , %
Rizamat variety 160-200 buds							
25% barren branches were harvested	31147,7	159,9	231926, 4	5200	69836,0	38688,2	115,7

(control)							
50% barren branches are cut	31482,9	195,5	198755,9	5200	82368,0	50885,1	148,9
75% of barren branches are cut	31846,7	181,1	161576,7	5200	102492,0	40645,2	120,8
100% barren branches are harvested	31504,8	156,6	227800,6	5200	71916,0	40411,1	119,4
Big Kurgon variety 160-200 buds							
25% barren branches were harvested (control)	32035,4	174,4	183479,0	5700	99522,0	67486,5	192,9
50% barren branches are cut	32372,3	198,8	166353,2	5700	110922,0	78549,6	220,3
75% of barren branches are cut	32714,2	186,6	152230,3	5700	122493,0	69778,7	217,1
100% barren branches are harvested	32180,3	175,5	175656,7	5700	104424,0	72243,6	204,8

It was noted that the production costs increased accordingly in the variants with increased Homtok standard. In such experimental variants, it was found that the total costs increased due to the additional harvesting due to the high yield depending on the rate of homtok.

Realization prices of grapes were calculated according to the sales price at the farm "Karima Muruvvat Agro" specializing in growing grapes of the Tashkent district of the Tashkent region. According to it, Husayne Bely variety was calculated at 4,000 soums/kg, Rizamat variety at 5,200 soums/kg, and Katta Kurgon variety at 5,700 soums/kg.

The data in the table shows that the highest yield was obtained in the option of the optimal standard of khumtok (50% khumtok of barren branches) and the highest gross income was 70,645.2 thousand soums in the Rizamat variety and 78,549.0 thousand soums in the Katta Kurgon variety. did The lowest gross income and net profit were recorded in the variant with the lowest yield of humus (25% humus). The gross income and net profit obtained from the realization of the harvest at this rate of cultivation amounted to 65520.0 thousand soums in the Rizamat variety and 61698.6 and 18507.2 and 93879.0 thousand soums in the Katta Kurgon variety (Table 3).

The analysis showed that the profitability level of food grape production in the experimental options with different rates of humming was recorded in the option of 50% humming of fruitless branches depending on the yield and gross income. The economic profitability of crop production under this method of rooting. The lowest yield in the Rizamat variety was 115.7% when 25% fruitless branches were rooted (control), and the highest yield was 148.9% when 50% fruitless branches were rooted. . In the rest of the options, it was determined that the profitability will be in the range of 115.7% to 120.8%.

The lowest yield of the Katta Kurgon variety of grapes was 192.9% when 25% unfruitful branches were pruned (control), and the highest yield was 220.3% when 50% unfruitful stems were pruned. In the remaining options, the profitability was found to be in the range of 192.9% to 220.3% (Table 3).

4. Conclusion.

1. It was observed that in the control version, there were 28.9% more fruitful branches in the Rizamat variety and 18.9% in the Katta Kurgon variety.
2. When studying the influence of the vine bushes on the chemical composition of humus, it was observed that the sugar content of the Rizamat variety was 4.6% higher than the control variant, and the acidity was 0.9 g/l less. It was found that the sugar content of the Big Kurgon variety is 3.3% higher, and the acidity is 0.7% lower than the control variant.
3. Experiments carried out when studying the effect of pruning on the yield of grape varieties showed that when 50% of unfruitful branches were pruned, the yield of the Rizamat variety was 29.1% higher and the yield of the Katta Kurgon variety was 15.1% higher than the control option.
4. In the studies conducted on the economic efficiency of khumtok varieties of grapes at different rates, it was noted that the highest yield was 41.5% in the Rizamat variety and 19.9% in the Katta Kurgon variety.

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