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Development of Technology Elements for Cultivation of Seedless Grape Varieties

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ABSTRACT

This article presents data on the study of the elements of cultivation technology of the large-berry variety Kishmish Botir. The studies were carried out at the Central Experimental Base of the Samarkand Research and Experimental Station of the Research institute of horticulture, viticulture and winemaking academician M. Mirzaev.

KEYWORDS: *load, eyes, shoots, pruning, yield, sugar content, acidity, dynamics of sugar accumulation, shoot growth*

Introduction

In world viticulture at the present time, there are a number of grape varieties, in the berries of which there are no seeds. Among them, a special group of varieties with an obligate and genetically determined form of seedlessness stands out - raisins belonging to the eastern eco-geographical group. These varieties are distinguished by a pleasant taste and high sugar content, their harvest is used for fresh consumption and the production of high-quality dried grapes.

At present, in general, the economic and biological characteristics of new seedless varieties have not yet been sufficiently studied. In particular, their potential possibilities have not been established both in terms of the productivity of bushes and in terms of quality indicators of the crop.

One of the effective methods of influencing the productivity of a grape plant and the quality of the products obtained is the regulation of the vegetative growth of bushes (especially varieties of the eastern ecological and geographical group, which are characterized by vigorous growth and reduced fruiting rates). The regulation of vegetative growth is determined by the pruning system and the load of bushes with eyes and shoots.

Research methodology: the study of the growth dynamics of shoots was carried out by measuring the linear dimensions of 10 shoots on each of the 5 bushes according to the options. Harvest counts were carried out by establishing the mass of all bunches on each accounting bush separately during the period of harvest maturity.

The sugar content of berry juice was determined (using a refractometer), the acidity of berry juice was determined by titration with 1/3 N alkali solution)

Statistical processing of the main data was carried out by the method of dispersion analysis (according to B.A. Dospekhov, 1985).

Experience scheme:
control - shaping and trimming used on the farm.

option I - load 100 eyes 55 green shoots, arrow length 6-9-12 eyes.

variant II - load 160 eyes 55 green shoots arrow length 6-9-12 eyes.

option III - load 220 peepholes 55 green shoots arrow length 6-9-12 peepholes.

Research results. As a result of many years of research conducted by the Samarkand Scientific Experimental Station, it was found that for various groups of varieties of raisin-table direction in the shelter zone of viticulture, a vertical trellis is acceptable, which has found wide distribution in industrial plantations. Of the formations of vine bushes with this method of management, which most fully meet the requirements of mechanization for the care of bushes, are one-sided fan formations.

In connection with the foregoing, a certain scientific and practical interest is the study of the productivity and quality of grapes of new seedless large-berry varieties with the indicated formations and management systems.

To introduce a new variety into the standard assortment and regionalize it, a technological assessment of the new variety is necessary, which determines the possibilities of its use as a raw material for studying one or another type of product.

In order to establish the main elements of the cultivation technology of new seedless large-berry varieties on an experimental basis, experiments were carried out with the Kishmish Botir variety.

During the autumn pruning of bushes, a load of eyes and shoots was given in accordance with the established standards of experience. As a result of the surveys, data were obtained (see Table 1.) from which it can be seen that options I and II had a slight excess, respectively (13% and 3.1%), and option III had an average load of 3% below the optimal one. With different trim lengths within the options, there are no significant differences in load. At the same time, these differences between the variants are quite significant in favor of large loads. This trend is also preserved in terms of the number of developed eyes and shoots, it varies both on the magnitude of the load and on the length of the pruning of the shoots. The highest rates were in option I, respectively, 60.0% and 61.1%, then slightly lower in option II - 58.3%, and the lowest in option III - 55.8%. Within the variants, these fluctuations were more significant, especially in the 1st variant, where, when pruning into 9 eyes, this indicator was absolutely high - 61.7 and 62.6%. However, in general, the trend has continued that short pruning stimulates fuller bud and shoot development, while long pruning maintains low levels of bud and shoot development.

The number of fruitful shoots and inflorescences per bush (Table 1.) invariably decreased to a greater extent due to the change in pruning length and the associated decrease in the total number of shoots per bush. Regression coefficient r = 0.93, i.e. more than 94% of changes in fruitful shoots depend on the number of developed shoots. Therefore, there is a low potential fruitfulness of the eyes along the length of the shoots, which is confirmed by research data. So the most fruitful are the eyes from the 6th to the 9th.

Table 1. Spring development of eyes and shoots, variety Kishmish Botir, 1998

Load Options	Loads of eyelets pcs	Shoot trimming length, eyes - piece	Developed ocelli		Developed shoots	
			piece	%	piece	%
Control (st)	126		83	65,8	83	65,8
I-100	118	6	71	60,1	73	61,9
	115	9	71	61,7	72	62,6
	105	12	61	58,1	61	58,1
Average	113		68	60,0	69	61,1
II-160	163	6	92	56,4	92	56,4
	165	9	96	58,2	96	58,2
	160	12	96	60,0	96	60,1
Average	163		95	58,3	95	58,3
III-220	209	6	118	56,6	118	56,6
	213	9	124	58,2	125	58,7
	223	12	119	53,4	119	53,4
Average	215		120	55,8	120	55,8
NSR_{05}	43,8		27,26		28,42	

The coefficients of fruiting, fruitfulness reveal another pattern: when pruning shoots for 6 eyes, only a slight increase can be traced, more noticeably, with increased load. With the longest pruning, it is undoubtedly lower than in other options, but at the same time it decreases as the load increases, while with a pruning length of 12 eyes, it was lower every time than with a different length of the arrows.

Thus, the surveys revealed that the lower the load, the higher the percentage of development, and at the same time, the higher the load, the more fruitful shoots and inflorescences. The advantage, therefore, in favor of large loads is a value 2 times higher than in comparison with small loads.

The coefficients of fruiting and fruitfulness did not have large differences between the variants.

Productivity and quality of grapes. From the analysis of yield data (Table 2.), first of all, it should be noted its clear dependence on the load of the shoots, which is mainly explained by the low fruitfulness of the eyes of the lower tiers of the shoot.

Table 2 The productivity of the bush and the quality of the grape harvest, variety Kishmish Botir.

Load Options	Shoot cutting length, eyes-pcs	Harvest from the bush, kg	Yield, centner/ha	Average bunch weight, g	Sugar content, %	Acidity, %
Control (st)		4,8	63,3	180	22,8	4,8
I-100	6	4,0	52,8	205	23,6	4,8
	9	6,9	91,1	307	23,8	4,7
	12	6,4	84,5	269	22,0	5,5
Average		5,8	76,5	278	23,1	5,0
II-160	6	6,4	84,5	205	23,3	5,1
	9	7,9	104,2	252	23,1	5,0
	12	67,5	89,1	215	23,4	5,0
Average		6,0	79,2	224	23,2	5,0
III-220	6	6,4	84,4	205	22,8	5,2
	9	8,1	106,9	188	22,4	5,4
	12	6,6	87,1	177	22,9	5,2
Average		7,2	95,0	191	22,7	5,3
NSR_{05}		1,8				

The lowest yield from a bush was obtained with a low load (B-I) - 5.8 kg, then at the optimum it increases to 6.0 kg and at an increased 7.2 kg. if we consider this indicator from the standpoint of the pruning length, it can be seen that the highest yield from the bush was obtained at load levels - lowering, optimal and increased when pruning by 6 eyes. As can be seen from the data obtained on the yield of bushes, both the length of the pruning of shoots and the direct load of eyes and shoots had a noticeable effect on its quantitative indicators.

Increasing the load to (160 buds) for this zone and increasing the pruning length to 9 buds proved to be favorable for higher yields. The shorter the pruning (6 buds), the less fruitful shoots and inflorescences, which means an inevitable decrease in the yield of bushes, the higher the load with buds (220 buds), the more nutrients go to growth processes and less to create a crop, quality indicators decrease.

The dynamics of sugar accumulation (see table 3.) showed that there were no significant differences in the total amount of sugar in the berry juice between the control and the experimental options. However, the nature of its growth in certain periods is not the same and unequal.

So, a more even character of sugar accumulation was on average in option II, here the highest sugar content of berry juice (23.3%) in options control and I, the process of sugar increase proceeds spasmodically, after a period of large accumulation there is a sharp decline and the cycles are repeated. Option III - increased sugar in berry juice intensively in the first 15 days from the date of registration, then there was a sharp general decline and here the lowest sugar content of berry juice (22.4%).

A probable explanation for this is that in variant I there is a more intensive growth of shoots and it is longer. Therefore, there is a noticeable cyclical process of sugar accumulation - at the beginning there is growth, then the leaves work for sugar, etc. In other variants, shoot growth is less intense and the leaf apparatus works evenly for a long time.

General growth and maturation of shoots. The total annual growth of shoots of bushes (see table 3.) turned out to be the weakest in control in option I 72-76.2, then increased by 24-25% with optimal and increased load. If we compare these indicators, in the context of the trimming length, it can be seen that with a short length (6 eyes), the smallest increase was obtained, both at a reduced and at an optimal load of 51.8. At the same time, with increased load and with an average trim length, an absolutely high increase of 94.2 was obtained.

It follows that under low load, the number of normally developed shoots and stepchildren was insufficient, and under optimal load, a higher yield load inhibited growth processes in favor of the generative organs of the bush.

In the variant with increased load, the ratio of shoots and yield at an average pruning length was more synchronous and ensured good growth and high yield. The ripening of shoots and stepchildren according to the variants of the experience was quite complete. The highest percentage of maturation was noted in variants I and control (82.7), other variants yielded by 15-18%, which indicates that there is an effect of higher yield.

Thus, from the analysis of biometric data, it can be seen that the studied factors of experience in a certain way influenced the growth and development of shoots of bushes, but there are no significant differences. The average length of the shoot and stepson, their matured part according to the variants of the experiment were close in quantitative and qualitative terms.

Properly established load of bushes largely determines the state of plantings, quantitative and qualitative indicators of grapes, as well as stability over the years. There is a close relationship between the number of full-fledged shoots and the mass of one-year growth. The impact of bush loads is quite significant. An increase in the load with eyes and shoots is accompanied by an increase in the number of clusters and productivity per bush. Overloading bushes with eyes and shoots leads to weakening of the bush and negatively affects the development of plantings.

The yield of bushes with an average load is 6-10% higher than with a low and high load. At low load, the mass of the bunch is 5-7% higher than at medium and high loads. The growth of shoots fluctuates over the periods of observation and was the largest in June, then the growth process decreased to a minimum in September. In July and August, with a rather slow growth rate of shoots, the growth advantage over options with a low load of shoots and a yield of 70% to 84.7%, and a one-year increase allows you to give the bushes an optimal load with eyes when pruning.

Based on the analysis of the experimental material obtained for the study and development of elements of the cultivation technology of the Kishmish Botir variety, the following conclusion can be drawn that the variant with a load of 160 shoots per bush and a pruning length of 9 eyes gives high indicators for the development of fruitfulness, productivity and quality of grapes.

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