Creating intensive nursery vineyards

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Abstract*. This article outlines the significance of creating special nursery vineyards for intensive propagation of grapevine seedlings. Illustrated the efficacy creating nursery vineyards in greenhouses for preparing wooden and green cuttings from vine bushes. It was observed that sufficient efficacy of vine cuttings amount was achieved from nursery vineyards in plastic greenhouses in the second-third years.*

Key Words: *vine, mother plant, nursery vineyards, greenhouses, cutting, seedling, root, sprout, variety.*

1. INTRODUCTION:

It is expedient to increase the production volume of high quality cuttings in order to create industrial vineyards of valuable varieties (particularly, resistant to cold, disease and pests) [3].

Implementation of the plan of creating new annual vineyards of the republic, reconstruction of obsolete vineyards of current low profitability lead to high demand for millions of high quality grapevine seedlings in the country.

Practical solution for these tasks is arrangement of private intensive and super-intensive nursery vineyards of newly selected and the best quality varieties on each seedling producing farms [1]. According to the results of experiments and researches, in this kind of nursery vineyards of agriculturally developed countries the seedlings are prepared 7-10 times more which allow to decrease the areas for seedling production.

Creating intensive and super-intensive nursery vineyards of cultural varieties through using the grafted seedlings prepared by vegetation growing way allows to the development of viticulture and increase in the quality of grapevine seedlings and efficacy of seedling production [4].

It should be emphasized that the measures on seedling production have not been studied thoroughly yet.

Developing production measures of high quality vine seedlings intends to create nurseries of grape seedlings and to study how to care of them, and modernize as well. These tasks are of prior significance on fast propagation of new varieties of vines.

In order to produce seedlings, grapevine shoots are usually prepared in yield industry vineyards. In this kind of vineyard preparation of cuttings is conducted in the third-forth years of propagation of this or that variety of vine. Fast method of seedling production by creating intensive nurseries in protected and open areas widens the preparation of cuttings considerably [2, 1].

As Kalyujniy A.I stated [2], capability of survival of growing seedlings which are planted in permanent place with substrate and undestroyed roots is higher and it allows to increase efficacy of creating industrial vineyards.

We have defined in our conducted researches that plantation of seedlings in the trays provided favourable condition for well growing of seedlings.

2. MATERIALS AND METHODS:

The research experiments were conducted on creation of intensive grapevine nurseries according to the methods recommended by Kh.Ch.Buriyev and others [1]. The condition of mother vine bushes during growth period was evaluated according to the methods suggested by L.V.Kravchenko and other scientists [4]. As an object of research were chosen raisin grapevine types such as black Kishmish, Kishmish sogdiana, technical types as Bayan Shirey, Saperavi, fresh types as Rizamat and pink Taifi which were inserted to state register of grapes.

3. RESULTS AND DISCUSSION:

As was identified by our researches, seedlings in pots provided favourable condition for their growth and well-development. When nurseries in open areas were created from growing seedlings, capability of survival of seedlings out of 500 planted seedlings showed low indication in pink Taifi variety, 441pieces and the highest indication was in black Kishmish variety, 458 pieces (Table 1).

Table 1
Capability of survival of growing seedlings, 2014-2017

Experimental variants	Grape varieties	Planting period	Quantity of seedlings, pcs		Capability of survival, %
			total	the survived	
Planting rooted seedling in open area	Black Kishmish	1,04	500	458	91,7
	Kishmish Sogdiana		500	434	86,8
	Bayan Shirey		500	428	85,7
	Saperavi		500	455	91,0
	Rizamat		500	437	87,4
	Taifi pink		500	441	88,2
Control 1: Planting cutting in open area	Black Kishmish	1,04	500	401	80,2
Planting rooted seedling in protected area	Black Kishmish	1,04	500	492	98,5
	Kishmish Sogdiana		500	496	99,3
	Bayan Shirey		500	492	98,5
	Saperavi		500	493	98,6
	Rizamat		500	491	98,2
	Taifi pink		500	492	98,5
Control 2: Planting cutting in protected area	Black Kishmish	1,04	500	415	83,1
LSD $_{05}$					3,2

At this time of planting of cuttings (control) by general method of production, the quantity of survived seedlings made 401 pieces. It is obvious that capability of survival of planted seedlings under growth is higher in all variants compared to the control.

It is expedient to plant close rooted seedlings under growth in the nurseries in protected areas. According to the data of fore mentioned table, favourable air and humidity of protected area enable growing seedlings to develop well and constantly. Quantity of survived seedlings out of 500 pieces that planted in this condition made in 98,2-99,3% limitation as per varieties. At the same time capability of survival of cuttings that planted by general method showed 83,1%.

Apparently, the aim of creating mother nurseries of grapevines is to produce high quality and healthy planting material (cutting). Production of qualitative planting materials from nurseries depends on growth power of grapevine bush and its capability of producing healthy shoots. As it was showed in investigations, mother bushes in open and protected areas vineyards created with growing seedlings differentiated by their high and fast growth power.

At the end of the first year vegetation the strongest bushes were observed in the bushes in protected areas planted with growing seedlings, then in open areas, and growing power of the seedlings planted by general method in control variant showed lower degree than the above ones.

General growth of seedlings in protected areas was 655-1146 cm higher by varieties compared to seedlings planted by cuttings. Though general growth of the seedlings planted in open areas is lower than the growth of the protected site seedlings, but it is 37-160 cm higher than the seedlings prepared from the cuttings by general method of production in the control variant (Table 2).

Table 2
The growth of one-year shoots of grapevine seedlings, 2014-2017

Experimental variants	Grape variety	Length of shoots of one bush, cm	Maturation degree of shoots,%	Diameter of shoots, mm
Open areas	Black Kishmish	475	80	7,5
	Kishmish Sogdiana	456	77	7,7
	Bayan Shirey	379	82	6,8
	Saperavi	382	79	7,1
	Rizamat	502	76	7,9
	Taifi pink	498	81	7,8
Protected area	Black Kishmish	1426	86	8,8
	Kishmish Sogdiana	1176	88	9,2
	Bayan Shirey	1018	83	8,1
	Saperavi	997	81	7,9
	Rizamat	1481	85	9,2
	Taifi pink	1488	85	9,5
Control-1 (open area)	Black Kishmish	342	71	7,4
Control-2 (protected area)	Black Kishmish	342	75	7,4
LSD$_{05}$		4,6		

It should be emphasized that for obtaining abundant high quality cuttings for planting maturation extent of shoots of mother bushes has a great significance. Calculation of matured shoot quantity at the end of vegetation period shows that mother bushes which are planted in open area with growing seedlings allow to produce 5-11% more mature shoots compared to control variants. Creating mother nurseries from growing seedlings in plastic film greenhouses enable to achieve more production. Maturation extent of shoots of these mother bushes is 6-13% more than control variant. Abundant production of mature shoots in plastic film greenhouses is defined by early and intensive beginning of their growth.

The best maturation of vine shoots is observed in the bushes grown in protected areas and it is defined by convenience of microclimate inside the building and the probability of its control. The lowest percentage of maturation of shoots is observed in open area control variants (71%), because while the cuttings are under rooting stage, experiment seedlings are under growing phase. Maturation extent of bush shoots of these varieties in industry vineyards created from standard seedlings showed 79%. Diameter of one-year old shoots of mother bushes grown in plastic film greenhouse made 0,5-1,8 mm higher than open area bushes. The reason is that protected area allows to manage important factors of external condition and to optimize life conditions of grapevine. Abundant quantity of well-grown shoots are formed in mother bushes of protected areas and almost 90% of them are worthy for preparation of standard cuttings.

As the below mentioned table data shows, due to weak growth and bad maturation of the shoots of mother bushes planted in open areas, there was no opportunity to prepare green and wooden standard cuttings in vegetation period.

Table 3
Preparation of cuttings with three buds from mother bushes of grapevine, pieces; 2014-2017

Experiment variants	Grape varieties	Second year		Third year	
		Green cutting	Wooden cutting	Green cutting	Wooden cutting
Open area	Black Kishmish	4	7	9	19
	Kishmish Sogdiana	4	8	10	20
	Bayan Shirey	3	6	7	16
	Saperavi	3	6	7	15
	Rizamat	5	10	10	20
	Taifi pink	5	9	11	21
Control 1: planting cutting in open area	Black Kishmish	-	-	3	7
Plastic film greenhouse	Black Kishmish	10	30	26	47
	Kishmish Sogdiana	10	31	27	48
	Bayan Shirey	8	21	21	38
	Saperavi	8	22	21	38
	Rizamat	11	31	27	48
	Taifi pink	12	32	28	49
Control 1: planting cutting in protec. area	Black Kishmish	1	3	6	13
LSD $_{05}$		0,4	0,4	0,4	0,4

In vegetation period of the second year of seedling planting each mother bush gave 3-5 pieces of green and 6-10 pieces of high quality mature wooden cuttings. In this period intensive growth of the seedlings which were planted in protected area allowed to obtain 8-12 green pieces of cuttings from each mother bush according to their variety, and at the end of vegetation this indication increased to 21-32 wooden pieces.

This tendency of growth power of grapevine bushes remained unchanged in the third year vegetation period. Although much less cuttings (both green and wooden) were produced from mother bushes of open area vineyard which was created with growing seedlings compared to protected area bushes, green cuttings of 4-8 pieces and 6-14 wooden cuttings were obtained more than the variant in which control cuttings were planted.

Mother nurseries that were created in protected areas showed their top results in the third year of the planting of seedlings by producing much enough green and standard wooden cuttings. The green cuttings prepared in this way increased to 21-28 pieces in each bush according to variety, while wooden cuttings reached to 38-49 pieces.

Table data shows that the creation of mother vineyards by planting growing seedlings with well-developed rooting system leads to prepare planting material - green and wooden cuttings from the second year of plantation. In the third year of these vineyards it is possible to produce 9-11 pieces of green and 19-21 pieces of wooden standard cuttings from fresh and raisin grape varieties in open land conditions. The efficacy of creating vine mother-nurseries in protected areas is higher, their productivity of producing green and wooden cuttings in the third year consists relatively 26-28 and 47-49 pieces.

4. CONCLUSION:

The most favourable condition for developing raisin variety of grape is provided by creating nurseries that can produce cuttings in plastic film greenhouses, total length of shoots of seedlings of this kind of nursery consists 997-1488 cm at the end of the first year vegetation, average diameter is 7,9-9,5 mm and maturation extent makes 81-86%.

In order to create grapevine nurseries that can produce cuttings, use of plastic film greenhouses has a significant efficacy. This type of nursery starts giving planting material from the third year of plantation and allows to prepare 42-56 thousand pieces of green and 76-98 thousand pieces of wooden cuttings per hectare.

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