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STUDY OF GOOSEBERRY VARIETIES IN DIFFERENT CULTIVATE CONDITIONS

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Abstract

The paper The paper reflected the results of scientific investigations on productivity of gooseberry varieties Kolobok, Captivator, Grushenka, Sadko, Smena, Severni captan in different growing conditions in field during the years 2003-2006 on not irrigated field and 2007-2010 on irrigated field. Studied varieties have a few thorns, resistant on American powdery mildew, less resistant to bean and septoria, resistant to high and low temperatures, except less resistant varieties Grushenka and Smena on large heat. The average weight of gooseberry fruits, of studied varieties on non irrigated field ranged from 2.0 to 3.2 g, and on irrigated field ranged from 2.1 to 3.9 g. The average yield of studied gooseberry varieties - non irrigated field ranged from 1.2 to 14.6 t / ha and average yield on irrigated field ranged from 7.4 to 19.5 t / ha.

***Keywords*:** gooseberry, variety, fruits weight, yield, resistance, thorny.

INTRODUCTION

Culture of gooseberry is prized for entering early bearing, regular higher productivity, food quality and high herbal, fruits universal use. The content of pectin substances in fruit allows the list to include barberry ant radiate cultures. Productivity of the barberry plant is 1.5-2 kg in the 4-5 year after planting, 3-6 kg / bush - in the years when you can get 5-8 t / ha of fruit, and sometimes depending on the variety and respecting the maintenance of plant production technology of fruit produced can reach 12-15-20 t /ha [1, 2, 3, 4].

Gooseberry culture is profitable than the fruit yield more than 2.0 t / ha. Gooseberry varieties are classified into three groups: productive - with a crop of 4.0 to 6.0 t / ha, productive environment - with 2.0 to 4.0 t/ha and low productivity - under 2.0 t/ha [5].

Gooseberry fruit size although it is a trait characteristic of the variety, vary greatly depending on the year and largely depends on age, condition of plants and climatic factors of vegetation period [6].

Planting distances range gooseberry is 2.5 to 3 m between rows and 1.2 to 1.5 m at a time - for commercial plantations, and where no mechanical working range of lines can be used for shorter distances 1.5 m between rows and 0.7 to 1.0 m at a time - for gardens attached to houses but intensive plantations should be taken into account the fact that although the intensity of illumination in these cases is lower, the leaf surface small changes and plant yields are high [7, 8, 9].

MATERIAL AND METHODS

Investigations on the influence of growing conditions on plant development, production and fruits quality of introduced gooseberry varieties: Kolobok, Captivator, Grushenka, Sadko, Smena, Severni captain were made in plantations established in the experimental field of the Institute of Horticulture in the period 2003 - 2006 on land irrigated with planting distance 2.5 x 1.00 m and the distance from 2007 to 2010 on irrigated land 1.5 x 1.00 m planting The investigations were carried out according to established methods for studying the shrubs.

RESULTS AND DISCUSSIONS

Placing the responsive gooseberry variety to different conditions can cause a deviation of the degree of damage to plant diseases. If the favourable conditions for placing this kind can exist in the resistant varieties or disease that affects very little. The American origin varieties are resistant to mildew, while European origin varieties are strongly affects [1]. Study gooseberry varieties introduced during the years 2003-2010, allowed their determination as disease resistance, high temperature and low spiny and results are presented in Table 1.

Table 1. Adaptive qualities of studied gooseberry

Varieties	Resistance to disease		Resistance to high tempera-tures	Cold resis-tance	Thornes
	Powdery mildew disease	Bean, Septoria			
1.Kolobok	high	low	high	middle	low
2.Captivator	high	high	high	high	low
3.Grushenka	high	middle	low	middle	low
4.Smena	high	low	low	middle	low
5.Sadko	high	middle	middle	high	low
6. Severni capitan	high	high	high	high	low

According to the results obtained and presented in Table 1 the studied gooseberry varieties are appreciated by American mildew resistance with the highest grade, that are resistant. Resistance to bean and septoria is weakest on varieties Smena and Kolobok. Cold tolerance is good in all varieties. All studied varieties are with few thorns, allowing harvesting fruit without problems, thanks very small number of thorns on the branches.

Gooseberry culture is resistant to drought, but in exceptional cases to reduce the influence of high temperatures and lack of rainfall on fruit production is necessary to apply irrigation on plantation development in critical moments - intensive plant growth and fruit maturation, submission buds fruits.

Fruit weight varies under the influence of several factors: the ability of the variety, planting conditions for maintenance, weather conditions, which every year is different - with different amounts of rainfall and temperature values during the formation of fruit, plantation age etc.

Rainfall characteristic for period of research, years 2003-2010, is displayed in Table 2.

Table 2. Climatic conditions, rainfall (mm) in Republic of Moldova

month	2003	2004	2005	2006	2007	2008	2009	2010
I	56,1	87,8	37,9	38,6	44,3	25,8	24,7	86,3
II	22,6	97,9	111,4	18,4	62,2	5,8	35,5	61,5
III	12,4	31,0	14,8	89,1	33,7	35,6	70,8	29,0
IV	34,9	28,0	49,5	36,6	36,5	43,2	2,7	45,1
V	20,6	75,0	75,8	97,1	19,0	42,6	33,3	69,2
VI	21,6	11,0	104,8	81,6	23,7	62,8	39,0	85,0
VII	17,4	101,0	17,6	53,0	3,6	50,2	67,2	67,2
VIII	27,4	25,6	150,9	67,7	33,8	30,8	32,6	53,0
IX	52,7	69,6	4,9	57,8	24,8	77,7	21,7	46,7
X	62,1	33,4	11,0	13,6	71,0	16,0	29,6	68,9
XI	9,9	72,3	48,1	9,7	59,7	15,7	8,4	40,4
XII	38,7	19,3	33,6	1,0	62,1	54,3	89,1	82,9
Sum/ year	376,4	651,9	660.3	560	474,4	460,5	454,6	735,2

As shown in Table 2 during the research period (2003-2010) the driest year was 2003 with 376.4 mm precipitation and the wettest - in 2010 with 735.2 mm precipitation. Distribution of rainfall during the vegetation is not uniform. The largest amount of precipitation fell during the research in June (2005) value of 104.8 mm in July (2004) with 101 mm, August (2005) to 150.9 mm, in September (year 2008) to 77.7mm.

Some gooseberry varieties studied under cultivation without irrigation and with irrigation on intensive or rare plantations were influenced differently.

On fruits mass the studied gooseberry varieties are fall in three groups: large fruits - more than 4g, medium fruits -2.5 to 4.0 g, small fruits, up to 2.5 g [10].

Research conducted on assessing the average weight of fruit from studied gooseberry varieties during the 2003-2006 years on non irrigated field and in 2007-2010 years on irrigated field allowed to assess the impact of irrigation on fruit size, and the results were included in the table 3.

As shown in Table 3, gooseberry cultivars studied were assessed by the average weight of fruit produced on irrigated land ranged between 2.0 g and 3.2 g variety Severni captain to

variety Smena and maximum mass of 2, 3 g variety Grushenka and variety Smena 4.1 g.

Table 3. Fruit weight of studied gooseberry varieties on diferrent cultivate conditions,g

Varieties	Mean, non irigate field	Maxi-mum	Mean, irigate field	Maxi-mum	Comparative growth of fruit mass on irrigated land	
					average	maxi-mum
1.Kolobok	2,2	2,5	2,8	3,7	+0,6	+ 1,2
2.Capti-vator	2,4	2,8	3,9	4,2	+1,5	+1,4
3.Gru-shenka	2,1	2,3	2,1	2,2	0	+0,1
4.Smena	3,2	4,1	3,6	4,3	+0,4	+0,2
5.Sadko	2,9	3,5	3,3	4,4	+0,4	+0,9

The average weight of fruit, gooseberry bush varieties studied obtained irrigated land values ranged from -3.9 g 2.1 g and maximum fruit weight ranged from 2.2 g to 4.4 g. up. Based on the results obtained in studying varieties of gooseberry has been established that fruit can be classified according to weight into three groups with: large fruits - Captivator (3.9 g), Smena (3.6 g), Sadko (3.3 g), medium fruits - Kolobok (2.8 g), small fruits - Grushenka, Severni captain (2.1 g). Comparative growth of the fruits weight on non irrigated land in comparison with irrigated land, the varieties Grushenca, Severni captain did not deviate essentially only from 0 to 0.1 g and the weight on the other varieties increased from + 0.4 g and 1.5 g.

Gooseberry fruits harvest is influenced by several factors that have a role. In gooseberry intensive plantations plants per hectare increase allows the harvesting of plantations increased compared to normal, where coefficient use of land is much higher. Age size of plantation key influences the yield. Plant maintenance conditions plays an important role, which significantly influences the quantity and quality of the harvest obtained. Research on the maintenance of varieties in different conditions allowed us to obtain the results included in Table 4.

Table 4. Yield of studied gooseberry varieties on diferrent cultivate conditions, t / ha

Variety	Mean, non irigate field	Max-imum	Mean, irigate field	Maxi-mum	Comparative growth of fruit mass on irrigated field	
					average	maximum
1.Kolobok	**7,4**	9,6	**13,8**	24,0	**+6,4**	+14,4
2.Captivator	**5,5**	8,8	**19,5**	32,7	**+14,0**	+23,9
3.Grushenka	**1,4**	2,0	**7,4**	8,0	**+6,0**	+6,0
4.Smena	**5,2**	6,5	**9,3**	10,0	**+ 4,1**	+ 3,5
5.Sadko	**5,3**	7,2	**9,5**	19,3	**+4,2**	+12,1
6.Severni capitan	**13,2**	20,8	**18,6**	25,3	**+5,4**	+4,5

Gooseberry varieties studied on irrigated land, according to the results presented in Table 4, can be classified into three categories of productivity: low productivity, productive and highly productive. The first category refers to variety Grushenca that does not support moisture deficit and high temperatures fall low on water and fruit affected by heat. Average yield obtained from this variety is - 1.4 t / ha. Productive varieties, which gave a fruits harvest from 4.2 t / ha up to 5.5 t / ha are Captivate (5.5 t / ha), Sadko (5.3 t / ha), Smena (5,2 t / ha).Highly productive varieties with the fruit production more than 6 t / ha are Severni captan (13.2 t / ha), Kolobok (7.4 t / ha). Maximum obtained yield of fruit production varied from 2.0 t / ha (variety Grushenka) up to 20.8 t / ha (variety Severni captan).

According to research conducted established that the average yield of gooseberry studied varieties in irrigated field ranged from 7.4 to 19.5 years 2007-2010 t / ha and maximum yield from 8.0 to 32.7 t / ha.

On smaller areas is possible the gooseberry planting scheme rather chunky, where the distance between rows of plants can be reduced up to 1.5 m and between plants in turn, depending on the vigour of growth, characteristic of the variety. Drought resistance of gooseberry crops permit to obtain good and without irrigation, but if it is irrigated, crop increased considerably.

The most productive among the varieties studied are: Captivator, Severni capitan, Kolobok, corresponding on average yield reached to 19.5 t/ha, 18.6 t/ha, 13.8 t/ ha. Limit of the variation on the average yield of produced fruits was established between 7.4 t/ha and 19.5 t/ha. Among the studied varieties under cultivation without irrigation and with

irrigation, in intensive plantations or not the studied varieties were affected differently.
Average fruits yield of the studied varieties under irrigation deviated essentially. Harvest increased in all varieties, starting with + 4.1 t/ha on variety Smena and ending with 14.0 t/ha on variety Captivator. Maximum fruits production ranged from 3.5 up to 23.9 t/ha.

CONCLUSIONS

1. As a result of research conducted to study varieties Kolobok, Captivator, Grushenka, Smena, Sadko, Severni captan agreed that: 1. The varieties included in the study are weak barbed, are resistant on main disease affecting the gooseberry - American mildew, less resistant to bean and septoria, resistant to low temperature, to high temperatures are resistant, except varieties Grushenka and Smena that are more weaker.
2. Weight average of gooseberry fruits of studied varieties – in the non irrigated land ranged from 2.0 to 3.2 g and maximum mass from 1.5 g up to 4.1 g. On irrigated land ranged from 2.1 to 3.9 g and maximum weight ranged from 2.7 g to 4.4 g up.
The average weight of fruit in non irrigation conditions compared to irrigated land, only the varieties and Severni captan, Grushenka has deviated from 0 to +0.1 g only, whereas the other varieties studied the average weight increased from + 0.4 g up to +1.5 g.
3. The average yield of studied gooseberry varieties - in the non-irrigated field ranged from 1.2 to 14.6 t/ha and maximum yield from 3.4 to 20.8 t/ha – average yield on irrigated field ranged between 7.4 to 19, 5 t/ha and maximum yield from 8.0 to 32.7 t/ha;
Average fruit production under irrigation compared with irrigated land has increased in all studied varieties, starting with + 4.1 t/ha on variety Smena and ending with +14.4 t/ha on variety Captivator, and maximum between + 3.5 t/ha and +23.9 t/ha.

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