

GROWING TECHNOLOGY IMPLEMENTATION OF BLACK CURRANT VARIETIES FOR BERRIES PRODUCTION IN DISTRICT SOROCA, REPUBLIC OF MOLDOVA

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Abstract

The paper presents data on the implementation technology of black currant fruit Soroca, c. Niorcani, and cultivated varieties, which are good for mechanical and hand harvesting: Chentaur, Titania, Ben Alder. Parameters were established bushes and characteristic features of varieties for mechanical harvesting. The mechanical harvesting, with black currant harvester with the capacity to harvest a high productivity of 7-9 t / day of fruit and is served only three workers. The manual harvesting, each 85-100 workers are trained daily, which can harvest each 3.5 to 4.5 t/day of black currant fruit. The average yield obtained from varieties cultivated black currant reached at: Ben Alder -1.1 t/ha, Chentaur-2.6 t/ha, Titania - 1.9 t/ha.

Key words: technology, black currents, variety, harvesting.

INTRODUCTION

Black currant *Ribes nigrum* L. is a shrub with a height of 0.8 to 1.8 m starting to capitalize on the 2nd after planting. Time of ripening berries of black currant is the second half of June, depending on variety fructification length is average from 14 to 20 days. Yield of studied varieties ranged from 0.96 t / ha (Iubileinaia) -6.72 t / ha (Kliymex). Fruit mass ranged 0.67 g (Iubileinaia) - 1.1 g (Compactnaia) [1].

Recommended planting distances of 0.8 to 1.2 m are in turn and 2.5 - 3 m between rows (3000-3300 plants / ha), the recommended plant species in plot 2-3 for a complete pollination. The governance bush plant, which is formed in 2-3 years after planting. Plant management is possible with trunk 20-40 cm, with a crown composed of 6-8 branches of skeleton, which support the trellis wires and installed at 40 cm from the ground. Productions are of 5-8 t / ha black currant, and duration of plantations reach 12-14 years [2].

If harvesting is done 5-7 days before the ideal point is determined differently for each variety, 30-36% of production is lost, don't get grains

size characteristic of the variety. If the optimal maturity is exceeded, decrease the content of vitamin C and acids, and grains begin to fall or impaired [3].

Labour productivity depends on the crop harvesting and currant fruit maturation simultaneous. Manual harvesting allows for 7 hours harvesting 25 kg from a high to a low yield -10 kg. Table fruit is fully mature to their maximum. Harvesting is carried out in dry properly in the outer destination. Mechanized harvesting is possible with MPIA-1 in plantations combine with compact varieties, mechanical harvesting for the interval between rows of 2.5 to 3.0 m with an inclination of up to 5 degrees. Labour productivity is 0.53 ha / hour harvested 1.2 t / hour. Combine to serve 3 people. In comparison with mechanical harvesting the productivity increase of 73 times, by car AIAM-200-8 only 26 times. The term redemption of blueberry harvesting machine is 3.5 years. Full harvest is at 94-97% [4].

Densely plantations of black currant in the 0.6 to 1.0 m plant height ranged from 116-128 cm Lia plodorodnaia varieties, Pobeda. Width varies from 140-166 cm. La bush varieties

often located in all parameters were restricted and fan between the rows. The development located less had a more uniform crown [5]. Manual harvesting allows obtaining qualitative fruits, collected selectively in containers that can be marketed for fresh use, and the mechanized harvest is packed in boxes of 4-5 kg. Need on the manual labor force and high harvesting costs favored the development of mechanized method of harvesting. Mechanized harvesting of gooseberry fruits is based on the vibratory shake by suction in vacuum [6].

MATERIALS AND METHODS

Investigations on growth and productivity of black currant varieties under cultivation in the new production of fruit plantation which was established in 2002 in the North of Moldova were made in Soroca, c.Niorcani. In terms of production were studied three varieties of black currant: Chentaur (early variety), Titania, Ben Alder with a compact bush form that allows the practical application of mechanized harvesting and partly depending on conditions - manual. Planting Distance - 3.0 x 0.5 m. Cooperative Sagittarius - s.Niorcani, Soroca, established in 2002 a plantation of black currant on a surface of 50 ha with three varieties propductive: Titania-35 ha ha Centaur-10, Ben Alder-5 ha

RESULTS AND DISCUSSIONS

Conditions for the development of black currant in the North of Moldova is favorable due to the fact that rainfall is more common, amount that falls starts at falling from 550 mm to the northwest, and summer temperatures are lower by several degrees compared to area South of the country mean July temperature are 19.5 ° C (Briceni).

To establish a plantation of black currant fruit with the possibility of mechanized harvesting is necessary to choose the best varieties to meet the requirements for mechanical harvesting. Very important is that after the structure and volume bush varieties are compact, not scattered but erect, fruit clusters easy to break, tear be dry and be simultaneously baking, do not fall down to reach fruit maturity etc.

Fruits production obtained from black currant plantation on grown varieties are exposed in Table 1.

Table 1. Peculiarities of black currant varieties for mechanical harvesting, planting year 2002

Varietyplanting distance	Parametrii tufei bush parameters				degree of separation length	fall of the fruits	cluster length, cm
	h, m	l, m	L, m	bush volume, m ³			
3,0 x 0,7 m Centaur	1.10 1.11 1.13	0.65 1.04 0.83	1.30 1.07 1.05	0.93 0.97 0.98	medium	medium	5-6,high
average	1.11	0.84	1.14	0.96			
Ben Alder	0.87 0.79 0.76	0.65 0.64 0.82	0.91 0.81 0.73	0.51 0.41 0.45	medium	small	3, short
average	0.81	0.70	0.82	0.46			
Titania	1.51 1.51 1.46	0.85 0.86 1.15	1.80 1.49 1.60	2.31 1.93 2.69	medium	medium	4,medium
average	1.49	0.95	1.63	2.31			
Limit of variation	0.81-1.49	0.7-0.95	0.82-1.63	0.46-2.31			

According to data presented in Table 1 Height of black currant bushes ranging from 0.81 to 1.49 m within the parameters length varied between 0.7-0.95 m, width ranged from 0.82 to 1.63 m, bush volume ranged between values 0.46 to 2.31 m³. In studying the degree of detachment of the fruit clusters was found that the separation of studied variety Chentaur, Titania and Ben Alder are medium. Fruit fall to the variety Ben Alder is small, on the variety Chentaur and Titania are medium. The largest cluster of 5-6 cm length is on early variety Chentaur, the shorter is on the variety Ben Alder and on Titania is medium.

Harvesting of black currant is carried out by two methods: manual and mechanized.

For mechanical harvesting used several types of machines to each half of the entire row or each entire row.

Mechanized harvesting of black currant berries, is carried out by car type Polish, Jagoda, Jarek 5, which collects each bush half row (Fig. 1).



Fig. 1. Mechanized harvesting of black currant berries, is carried out by Polish type car

In cooperative mechanized harvesting Sagittarius black currant variety Titania is carried out by car type MKX English currant harvester that can harvest 3-4 hectares per day. Mechanized harvesting of berries of black currant variety Titania drive type English in Soroca, s. Niorcani, which collects each entire row (Fig. 2).



Fig. 2. Mechanized harvesting of berries of black currant variety Titania drive English type car, Soroca, s. Niorcani

Mechanized harvesting of black currant, variety Titania, is carried out by car type harvesters English currant MKX, which can harvest 3-4 hectares per day. Productivity harvesters of black currant berries can reach 7-9 t / day where only three workers involved in work. In the absence of labor in the plantations on large areas harvester has a unquestionable advantage. In a plantation of black currant berries with a yield of 3 t / ha recover investments made in purchasing harvesters can be done for 3-4 years. Simultaneously in plantation harvesting is carried out manually and black currant.

Manual harvesting is applied in variety Chentaur. Are involved in each daily harvest 85-100 workers, who can harvest each 3.5 to 4.5 t / day.

Price for 1 kg berries harvest ranges from 1.5 to 3.0 lei depending on the quality of harvesting and planting productivitatea. Labour productivity of a worker harvesting of black currant berries is 40-50 kg / day.

Productivity of black currant plantation depends on several factors that influence directly or indirectly. First is the significant influence of technological elements applicable maintenance capacities varieties used in plantations, pedo-climatic conditions, plant age, crop etc full record.

Planting varieties that are created or adapted to new conditions and expressed differently by crop cultivation has been obtained.

On the 2007-2009 years were drought years with high temperatures in summer and very rainy year 2010 was during the ripening of fruits which compromised the harvest of black currant. Fruits production obtained from black currant plantation on grown varieties are exposed in Table 2.

The highest harvest was obtained from variety Chentaur 3.2 t / ha in 8 th year after planting, with a decrease in the following year.

This is an early variety, and benefits for the marketing fresh. Titania is a good variety to variety mechanized harvesting, the harvest of lower (up to 2.5 t / ha in the 8th year after planting), but harvesting costs are considerably lower.

Table 2. The amount of fruits production in different black currants varieties, t/ha, 2004-2010

Variety	Year after planting							Average
	3	4	5	6	7	8	9	
Chentaur (timpuriu)	2.5	2.7	2.7	3.0	2.7	3.2	1.2	2.6
Titania	1.7	2.0	2.2	2.2	2.0	2.5	1.0	1.9
Ben Alder	1.0	1.2	1.2	1.3	1.0	1.2	0.5	1.1

Variety Ben Alder is a compact bush variety with a volume smaller than the other two varieties, harvested accordingly has a small (not exceeding 1, 3 t / ha in the 6 th year after planting), but can still be harvested mechanically.

CONCLUSIONS

In conclusion we can say that:

- Height of black currant bushes ranging from 0.81 to 1.49 m within the parameters length varied between 0.7-0.95 m, width ranged from 0.82 to 1.63 m, bush volume ranged between values 0.46 to 2.31 m³.
- Detachment degree of the fruit clusters was found that the separation of berry is medium on all studied variety.
- Fruit fall to the variety Ben Alder is small, on the variety Chentaur and Titania is medium.
- The largest cluster of 5-6 cm length is on early variety Chentaur, the shorter on the variety Ben Alder and Titania is medium.
- The implementation technology of black currant fruit in Soroca, Niorcani in terms of production allowed combining manual and mechanical methods of harvesting the cultivated varieties - Chentaur, Titania, Ben Alder.

-Mechanical harvesting, with black currant harvester, which has a harvest yield of 7-9 t / day of fruit and is served only three workers.

-Manual harvesting, each 85-100 workers are trained daily, which can yield many 3.5 to 4.5 t / day of black currant fruit - black currant average yield obtained from cultivated varieties: Ben Alder - 1.1 t / ha, Chentaur -2.6 t / ha, Titania - 1.9 t / ha.

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