

## EFFECT OF PLANTING DISTANCES ON THE GROWTH AND YIELD OF RHUBARB

### EFECTUL DISTANȚELOR DE PLANTARE ASUPRA CREȘTERII ȘI PRODUCȚIEI DE REVENT

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**Abstract.** *The aim of the present research was to study the influence of planting distances on the growth and yield on rhubarb, cultivars of Victoria, Glanskin's perpetual and local population. Applying differential cultivation technology, rhubarb yield varies according to crop density. The highest production was obtained in case of Victoria cultivar at density of 13.330 pl.ha<sup>-1</sup> (0.75 m x 1 m). Statistically assured yields were also obtained at the density 10.000 pl.ha<sup>-1</sup> (1 m x 1 m) on the same cultivar. Total yield varied within wide limits according to planting distances, ranging from 24.480 kg.ha<sup>-1</sup> to 41.460 kg.ha<sup>-1</sup>.*

**Key words:** plant density, growth and yield, cultivars, rhubarb

**Rezumat.** *Scopul cercetării de față a fost acela de a studia influența distanțelor de plantare asupra creșterii și producției la revent, în cazul cultivarelor Victoria, Glanskins perpetual și o populație locală "de Moldova". Prin aplicarea diferențiată a tehnologiei de cultivare, producția de revent variază în funcție de distanțele de plantare. Cea mai ridicată producție s-a înregistrat în cazul în cultivarului Victoria, când plantarea s-a făcut la distanțe de 0,75 m x 1,0 m. Producții, de asemenea, asigurate statistic au mai fost obținute și în cazul distanței de plantare de 1 m x 1 m la același cultivar. Producția totală a variat în limite foarte largi în funcție de distanța de plantare, variind de la 24,480 kg/ha la 41,460 kg/ha.*

**Cuvinte cheie:** densitate, creștere și producție, cultivare, revent

## INTRODUCTION

The rhubarb (*Rheum rhabarbarum* L.) is a less known and spread crop in Romania. It is a perennial vegetable species, adapted to cold temperate climate (Ciofu *et al.*, 2004; Indrea *et al.*, 2007).

Rhubarb is originated in the Himalayas, where its root was an important medicine believed to purge the body of ill humors (Stan *et al.*, 2003).

In our country rhubarb is more cultivated in the western part of the country and it is used for compot, jam and other dessert (Treptow, 1985).

In the last time rhubarb products are spread by the supermarket on all over the country. So it is a good opportunity for farmers to cultivate this species also in other parts of the country, not only in the traditional ones.

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For this reason, our research was focused to evaluate the possibilities to cultivate rhubarb in the environmental condition of the Eastern part of Romania.

To achieve this good our objective was to study the influence of the cultivar and planting distances on the crop and, mainly, on the yield (Stoleru, 2013).

Distance between plants in the row and between rows is a technological factor influencing crop density, which is number of plants per unit area. This technological factor, determined directly from the feeding soil surface, light regime etc. (Loughton, 1969).

## MATERIAL AND METHOD

Management of experiment. To achieve the goal and objectives of this research work, an experimental was done at “V. Adamachi” Experimental Station of the Agronomic University, using root cuttings of Glanskin’s perpetual (fig.1), local population (fig. 2) and Victoria (fig.3) cultivars. Harvested area of experimental plots covered the 5 plants.

Considering the importance studying factors in the growing technology, their ability to change and taking into account the possibilities of organizing experience, it was established hierarchy of factors, as follows:

1. A factor – cultivars, with three graduations: Glanskin’s perpetual, local population and Victoria;
2. B factor – planting distances, with two graduations: 0.75 x 1.00 m and 1.00 x 1.00 m.



**Fig. 1** Rhubarb – Glanskin’s perpetual (original)



**Fig. 2** Rhubarb – Local Population (original)



**Fig. 3** Rhubarb – Victoria (original)

**Collection and processing the experimental data.** The experimental data collection was carried out observations and weight measurements, according to the experimental technique used in experiments. During 2015 were made a total of eight harvesting: 04.04, 11.04, 20.04, 28.04, 08.05, 15.05, 26.05 and 18.06.

The experimental variants were compared with the experimental mean, using the percentage reporting and differences. The influence of experimental factors was assessed using ANOVA. The significance of differences was assessed on the basis of LSD (least significant difference) for three degrees of confidence (95%, 99%, 99.9%).

## RESULTS AND DISCUSSIONS

Applying differential cultivation technology, rhubarb production varies according to cultivar and crop density.

Regarding to the influence of planting distances and cultivar, during 2015, it ranged from 24.48 t/ha at Glanskin's perpetual cultivar with 1.00 x 1.00 m planting distance to 41.46 t/ha at Victoria cultivar with 0.75 x 1.00 m planting distance (tab. 1).

Table 1

**Influence of cultivar and planting distances at rhubarb crop**

Variants	Total yield (t/ha)	% to the average	Difference to average (t/ha)	Semnificance of differences
c <sub>1</sub> d <sub>1</sub>	28.76	89.07	-3.53	00
c <sub>1</sub> d <sub>2</sub>	24.48	75.81	-7.81	000
c <sub>2</sub> d <sub>1</sub>	34.89	108.05	2.60	**
c <sub>2</sub> d <sub>2</sub>	29.13	90.21	-3.16	00
c <sub>3</sub> d <sub>1</sub>	41.46	128.40	9.17	***
c <sub>3</sub> d <sub>2</sub>	35.03	108.49	2.74	**
<b>x (Average)</b>	32.29	100.00	0.00	-

LSD 5% = 1,01 t/ha; LSD 1% = 2,05 t/ha; LSD 0,1% = 7,41 t/ha

c<sub>1</sub> – Glanskin's perpetual; c<sub>2</sub> – Local population; c<sub>3</sub> – Victoria; d<sub>1</sub> – 0,75 x 1,00 m; d<sub>2</sub> – 1,00 x 1,00 m

### **Influence of planting distances on rhubarb yield**

Very negative differences significantly, compared to the average have been obtained when Glanskin's perpetual cultivar is planted at distances 1.00 x 1.00 m.

Positive differences compared to the average have been obtained when

Glanskin's perpetual cultivar planted at distances of 0.75 x 1.00 m, and local population cultivar planted at distances of 1.00 x 1.00 m.

The differences obtained between experimental variants and experimental mean average, ranged from -7.81 t/ha for Glanskin's perpetual cultivar planted at 1.00 x 1.00 m, up to 9.17 t/ha for Victoria cultivar planted at 0.75 x 1.00 m.

The total yield in case of rhubarb crop ranged from 24.48 t/ha, for Glanskin's perpetual cultivar planted at distances 1.00 x 1.00 m, to 41.46 t/ha, for Victoria cultivar planted at distances 0.75 x 1.00 m.

## CONCLUSIONS

1. Regarding the influence of planting distances and cultivar on rhubarb total yield during 2015, it ranged from 24.48 t/ha for Glankin's perpetual cultivar planted at distances 1.00 x 1.00 m, to 41.46 t/ha, for Victoria cultivar planted at distances 0.75 x 1.00 m.

2. Very negative differences significantly, compared to the average have been obtained when Glankin's perpetual cultivar is planted at distances 1.00 x 1.00 m.

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