

RESEARCH ON THE BEHAVIOR OF VEGETABLE SPECIES IN POTS AND CONTAINERS

CERCETĂRI PRIVIND COMPORTAREA UNOR SPECII LEGUMICOLE ÎN GHIVECE ȘI CONTAINERE

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Abstract. *The paper presents the research results regarding the evaluation of morphological, physiological and production characteristics in some vegetable plants grown in pots and containers. The vegetable plants studied were: cherry tomatoes, sweet peppers, climbing beans, dwarf beans, oregano and lovage, and for pot culture: hot peppers, basil, salad, thyme, dill and parsley. Remarkable results were obtained for the following vegetable species: cherry tomatoes 1656.0 g / pl ant and pepper 2305g / pl for container culture, and for pot culture the results were: hot pepper, 351.3g / pl and salad 250.0 g / pl.*

Key words: quality, productivity, vegetables species

Rezumat. *Lucrarea prezintă rezultatele de cercetare referitoare la evaluarea unor caracteristici morfologice, fiziologice și de producție la unele plante legumicole cultivate în ghivece și containere. Plantele legumicole luate în studiu, au fost: tomatele cherry, ardeiul gras, fasolea urcătoare, fasolea oiașă, oregano și leușteanul, iar pentru cultura la ghivece: ardeiul iute, busuiocul, salata, cimbrul, mărarul și pătrunjelul. Rezultate remarcabile au fost obținute la următoarele specii legumicole: tomate cherry 1656,0 g/pl și ardeiul gras 2305g/pl pentru cultura la containere, iar pentru cultura la ghivece rezultatele deosebite au fost: ardeiul iute 351,3g/pl și salata 250,0g/pl.*

Cuvinte cheie: calitate, productivitate, specii legumicole

INTRODUCTION

Enriching the knowledge regarding the cultivation of vegetable plants in pots and containers, in order to increase the yields and the quality of the production, can contribute to increasing the chances of expansion in our country (Gache *et al.*, 2018). The improvement of the technical and economic results, at the level of this culture system, represents an objective necessity and can be achieved, under good conditions, by a continuous process of optimization (Purnell, 2007). Evaluating the knowledge in the Romanian specialized literature, one can observe the low and incomplete share of scientific information, although at the global level, detailed knowledge of the systematics of this culture system with all the benefits it presents. The special interest for growing plants in pots and containers is mainly due to the lack of space required for a garden (Gache *et al.*, 2017). The

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cultivation of vegetables in pots and containers is a necessity - if we want fresh and healthy vegetables (Stoleru, 2013; Teliban and Munteanu, 2009), it is a utility, because all that is obtained in these spaces are products that are of human use and to these are added numerous opportunities (Gache *et al.*, 2019). The present paper presents the research results regarding the evaluation of some morphological, physiological and production characteristics in some vegetable plants grown in pots and containers.

MATERIAL AND METHOD

The research was carried out at the Didactic Station of the University of Agricultural Sciences and Veterinary Medicine of Iasi. Three types of substrate were used: S1- substrate made from garden soil 35%, compost 35%, peat 20%, sand 5% and perlite 5%, S2- substrate made from garden soil 35%, compost 20 %, peat 35%, sand 5% and pearl 5% and S3 - commercially available standard substrate containing coconut and clay peat, with a modified dose of limestone, enriched with mineral fertilizer. The substrates thus obtained, as well as the S3 substrate (standard) from the trade, were used in the cultivation of pots and containers. To achieve the experience, the three substrates were used in the four types of vessels (60 L, 25 L, 5 L, 2.5 L). The respective vessels were placed in the experimental field of vegetable culture on a level ground and at distances of about 50 cm from each other, in order to eliminate the effect of mutual bordering (neighborhood). The cultivated species were those mentioned in the summary of this work.

RESULTS AND DISCUSSIONS

The results are structured in the following major directions, regarding: the phenological, morphological and productive characterization of the vegetable plants used (Avasilcăi *et al.*, 2017; Galea *et al.*, 2016, 2017, 2018; Hamburdă *et al.*, 2016; Munteanu, 2003; Stoleru *et al.*, 2016; Teliban *et al.*, 2016). The importance of these characteristics is given precisely by the characteristics of the vegetable plants under the experimental cultivation conditions, respectively in pots and containers. I should mention the fact that vegetable plants grown in pots and containers had a phenology and morphology that fit into the botanical description of these species, so under the presented experimental conditions the ecological requirements of the plants were met, which allowed a proper growth and development of the plants them (Gache *et al.*, 2019).

The productive characterization of the vegetable plants studied, highlighted some peculiarities regarding their productive potential, under the conditions of cultivation in pots and containers on the substrate S1. The synthesis of the experimental data highlights the fact that, in the culture in pots and containers, the dynamics of the crops had a special evolution for the following vegetable species: cherry tomatoes in container to 60L, 1656.0 g / pl, (data presented in table 1), cherry tomatoes in container to 25L, 944.0 g / pl (table 2), peppers 2305.0 g/ pl in container to 60L (tab. 3), peppers 1289.0 g / pl in container to 25 L (tab. 4), and for pot culture the special results were: hot pepper 351.3g / pl in pot to 5 L (data

presented in tab. 5), hot pepper 151.3g / pl in pot to 2.5 L (tab. 6) and salad 247.1g / pl in pot to 5 L (tab. 7) and salad 250.0 g / pl in pot to 2.5 L (tab. 8). The production results for the three types of substrate obtained from the study show that they have an obvious influence for each crop.

Table 1

Seasonal harvest of cherry tomato fruit in 60 L pot

Cherry tomato	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S ₁	-	489.5	476.2	423.1	267.2	1656.0
S ₂	-	376.2	311.1	369.4	127.3	1184.0
S ₃	-	292.4	379.6	174.0	98.0	943.0

The total yield of cherry tomato crop in 60L jar ranged from 943.0g / pl for S3 substrate, to 1656.0 g / pl for S1 substrate. The production results show that, in general, all substrates have the same stepping pattern as shown in figure 1.

Table 2

Seasonal harvest of cherry tomato fruit in 25 L pot

Cherry tomato	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S ₁	-	292.4	379.6	174.0	98.0	944.0
S ₂	-	192.6	199.5	110.5	83.6	586.2
S ₃	-	98.4	86.2	98.4	74.8	357.8

The total yield of cherry tomato crop in 25 L pot ranged from 357.8 g / pl for S3 substrate, to 944.0 g / pl for S1 substrate (table 2).

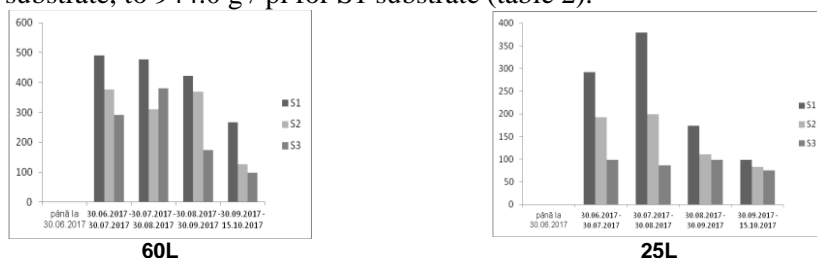


Fig. 1 Graphic representation of the cherry tomato harvest seasoning

Table 3

Seasonal harvest of peppers fruit in 60 L pot

Peppers	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S ₁	-	608.5	721.8	663.9	310.8	2305.0
S ₂	-	424.9	321.6	325.1	217.4	1289
S ₃	-	331.8	310.3	189.3	184.6	1016

The production results for the cultivation of peppers in containers of 60L, ranged from 721.8g / pl in the period 30.07-30.08 for the substrate S1, to 184.6 g / pl in the period 30.09 - 15.10, for the substrate S3. The highest yields were

recorded between 30.07-30.08, with a production of 721.8g / pl and 663.9g / pl during the period 30.08 -30.09, for the S1 substrate. The lowest results for the cultivation of peppers were recorded between 30.09 - 15.10, respectively for the substrate S3 (figure 2).

Table 4

Seasonal harvest of peppers fruit in 25 L pot

Peppers	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S₁	-	458.9	320.0	285.4	224.7	1289.0
S₂	-	360.0	270.0	130	100.0	860.0
S₃	-	124.9	95.4	102.3	106.4	429.0

Production results for the cultivation of peppers in 25L containers, ranged from 95.4 g / pl for substrate S3, to 320.0 g / pl for substrate S1 between 30.07-30.08 (fig. 2).

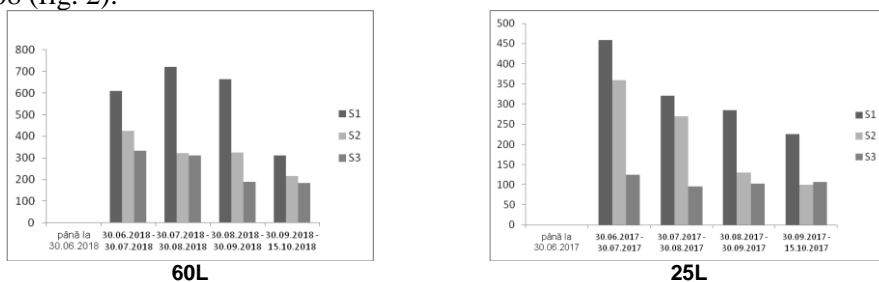


Fig. 2 Graphic representation of the peppers harvest seasoning

Table 5

Seasonal harvest of hot pepper fruit in 5 L pot

Hot pepper	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S₁	57.3	96.1	91.0	81.3	25.6	351.3
S₂	52.1	98.3	53.5	45.6	14.3	263.8
S₃	32.1	86.4	34.3	10.0	8.7	171.5

The total production in the pepper crop varied from 171.5 g/pl for the S3 substrate, to 351.3 g/pl for the S1 substrate in the 5 L pot (tab. 5).

Table 6

Seasonal harvest of hot pepper fruit in 2.5 L pot

Hot pepper	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S₁	57.3	46.1	91.0	31.3	25.6	151.3
S₂	22.1	28.3	23.5	25.6	14.3	113.8
S₃	12.1	36.4	14.3	10.0	8.7	81.5

The highest yields were recorded between 30.07-30.08, with a production of 91.0g / pl on the substrate S1 (fig. 3).

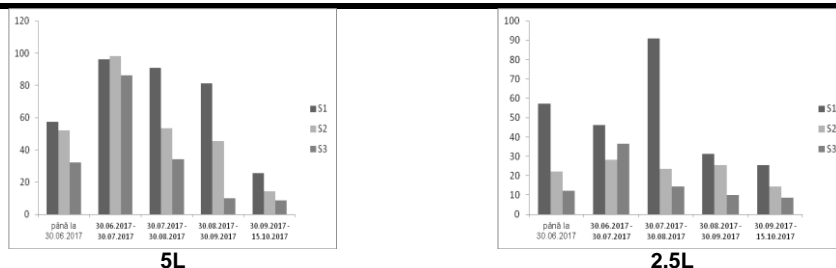


Fig. 3 Graphic representation of the hot peppers harvest seasoning

Table 7

Seasonal harvest of salad in 5 L pot

Salad	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S ₁	-	247.1	-	-	-	247.1
S ₂	-	151.2	-	-	-	151.2
S ₃	-	95.1	-	-	-	95.1

The total production in salad culture ranged from 95.1 g/pl for substrate S3, to 247.1 g/pl for substrate S1 (tab. 7).

Table 8

Seasonal harvest of salad in 2,5 L pot

Salad	up to	30.06 30.07	30.07 30.08	30.08 30.09	30.09 15.10	Prod. total/pl (g)
S ₁	-	250.0	-	-	-	250.0
S ₂	-	150.0	-	-	-	150.0
S ₃	-	98.0	-	-	-	98.0

The total production in salad culture ranged from 98.0 g / pl for substrate S3, to 250.0 g / pl for substrate S1 (figure 4).



Fig. 4 Graphic representation of salad harvest seasoning

CONCLUSIONS

1. The culture of vegetable plants in pots and containers is suitable for the species studied.
2. The production results on the species / cultivars studied during the three years as well as their average were remarkable.

3. The experimental values of production have emphasized the importance of the composition of the substrate S1.

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