

THE INFLUENCE OF USING SUPERABSORBENTS ON SWEET PEPPER AND TOMATOES SEEDLING GROWING TECHNOLOGY

INFLUENȚA UTILIZĂRII SUPERABSORBANȚILOR ÎN PRODUCEREA RĂSADURILOR DE ARDEI GRAS ȘI TOMATE

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Abstract. *The experiences were accomplished within peppers and tomatoes seedlings growing process by using different substrates with peat, perlite, sand, decomposed manure and superabsorbent. The aim of the paper is establishing the opportunity of obtaining high quality seedlings on different types of substrates improved with superabsorbent polymers. Best results were obtained for both vegetable species (pepper and tomatoes) grown on a substrate containing peat and superabsorbent.*

Rezumat. *Experiențele au fost realizate în procesul de producere a răsadurilor de ardei și cele de tomate, folosind diferite amestecuri nutritive formate din turbă blondă, perlit, nisip, mranită și superabsorbant. Scopul lucrării este acela de a stabili oportunitatea obținerii unor răsaduri de calitate superioară pe diferite tipuri de substraturi îmbunătățite prin adăugarea polimerilor superabsorbanti. Cele mai bune rezultate au fost obținute folosind un substrat format din turbă și superabsorbant atât pentru ardei, cât și pentru tomate.*

Research was accomplished in didactic and experimental area of Vegetable Growing department. The present research consisted in testing some growing substrates for sweet pepper and tomatoes transplants production.

MATERIAL AND METHOD

Sweet pepper (hybrid *Blondy F1*) and tomatoes (*Unirea*) represented biological material taken for present study. For both species, sowing in "speedling" system at the beginning of March produced the transplants.

It has been accomplished different nutritive mixtures formed of blonde peat, perlite, sand, decomposed manure and superabsorbent, resulting five experimental variants for tomatoes and four for sweet pepper as following:

Sweet pepper: **V₁** (witness): peat; **V₂**: peat (75 %) and perlite (25 %); **V₃**: peat (75 %) and sand (25 %); **V₄**: peat and superabsorbent; **V₅**: peat (60 %), decomposed manure (40%) and superabsorbent.

Tomatoes: **V₁** (witness): peat; **V₂**: peat (75 %) and sand (25 %); **V₃**: peat and superabsorbent; **V₄**: peat (75 %), decomposed manure (25 %) and superabsorbent.

During transplants production period were made certain observations, determination and measurements on plants (specific for every settled objective) as following: seeds germination speed, the dynamic and percent of plantlets appearance for every variant, determination on plants development expressed through plantlets height and leaves width and length, observations on transplants development uniformity after seeds germination.

Care operations applied to the transplants were similar for all variants.

RESULTS AND DISCUSSIONS

Plots of sweet pepper and tomatoes seeds were taken for present study. For sweet pepper, the plot was divided in five groups (five experimental variants) each of them with 40 seeds; for tomatoes, the plot was divided in four experimental variants each of them having 70 seeds.

During the study of seeds germination process at pepper and tomatoes it has been noticed that it began after eight days from sowing at sweet pepper (an average of 10%) and four days at tomatoes (an average of 11,8%). Another significant aspect: at sweet pepper hybrid (in the first eight days) germination and plantlets appearance happened in 30-40% percents (at V_4 and V_5 – with superabsorbent), but at V_3 (in the same period of time) plantlets appearance percent was of 7,5 %.

Representing graphically the germination percent of sweet pepper and tomatoes seeds (fig. 1 and fig. 2) it can be noticed that germination speed at sweet pepper (eight days) and tomatoes (five days) registered higher values at some variants.

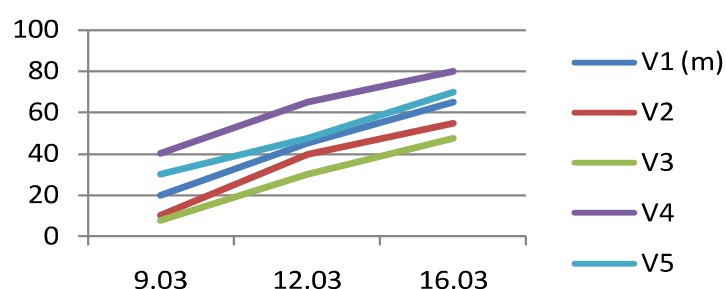


Fig. 1. Germination dynamic at sweet pepper seeds in different substrates:
 V_1 (witness) peat; V_2 : peat and perlite; V_3 : peat and sand;
 V_4 : peat and superabsorbent; V_5 : peat, decomposed manure and superabsorbent.

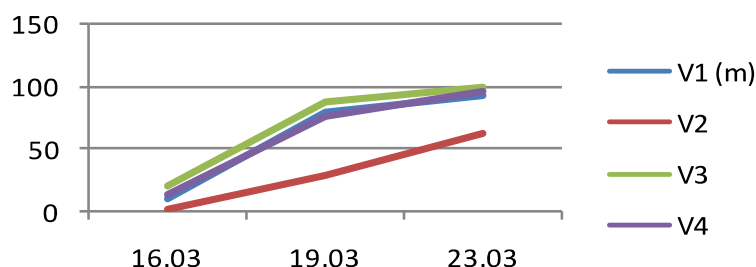


Fig. 2. Germination dynamic at tomatoes seeds in different substrates:
 V_1 (witness) peat; V_2 : peat and sand; V_3 : peat and superabsorbent;
 V_4 : peat, decomposed manure and superabsorbent.

For sweet pepper - 40 % at V₄ on a combination of peat and superabsorbent, followed by V₅ and V₁ (witness) with over 20 %. Smaller values of germination speed registered at V₂ and V₃; the substrates of these variants had in composition (as additional elements) perlite and sand. For tomatoes, superabsorbents influence was pointed out by high seeds germination percent for V₃ (20 % in the first four days and 100 % after approximately one week) and V₄ (14,28 % and 97,14 % after 12 days). Variant V₃ had in composition sand and registered lowest values (2,85 % in the first days and 62,85 % at the end of determination).

In order to emphasize the influence of nutritive substrate (and especially of those with superabsorbent) on some transplants characteristics various observations and measurement were accomplished (height, leaves width and length). It has been also noted from 1 to 5(4) for growing and development uniformity for each variant taken for study (1 – low growing and development uniformity, 5(4) – high growing and development uniformity).

Determination accomplished during sweet pepper and tomatoes transplant production demonstrated that the transplant grown in all nutritive mixtures framed in normal limits regarding the quality. Nevertheless some differences appeared. Sweet pepper transplants produced in medium with superabsorbent registered higher values regarding leave size (height, width and length) and uniformity (table 1, figure 1). Therefore, the best values were obtained at V₄ (peat and superabsorbent) and the worst values at V₃.

The benefits of superabsorbents use in nutritive mixtures destined to transplants production are underlined in tomatoes case, the most vigorous plants being obtained at V₃ (table 2, figure 2).

Finally it can be concluded that transplants produced in nutritive substrates with superabsorbent presented a superior quality and a high vigour expressed through height. It can also be noticed that transplants obtained in substrates with superabsorbent had a higher growing and development capacity and a good capacity of extracting water and nutritive elements which are very necessary to a normal growing.

CONCLUSIONS

From the experiences with different nutritive substrates for transplants production the following conclusions can be drawn:

1. Nutritive substrates with superabsorbents assured better germination conditions comparing with substrates with sand and perlite that assured a germination percent of more than 70 %.

2. Nutritive substrates with superabsorbents assured better transplants growing and development conditions. The transplants obtained on these substrates had a superior quality and they were capable of assuring very good yields. The plants had a high vigour expressed through height associated with a high number of leaves coloured in a

characteristic manner, very healthy and with a 4-5 mm thickness at the plant base. The roots - expressed through their weight and length - were well developed and capable of extracting the water and mineral elements necessary for transplants development.

3. Nutritive substrates with superabsorbents assured better roots strike and resistance to drought by reducing the percent of broken roots and assuring the necessary of water immediately after planting.

4. The variants with sand and perlite could not assure good conditions for transplants production because those substrates were very settled, colder and they had a lower capacity of retaining water.



Fig. 1. The influence of nutritive substrates on development of sweet pepper transplants



Fig. 2. The influence of nutritive substrates on development of tomatoes transplants

Table 1

The influence of nutritive substrates on sweet pepper transplants growing and development

Variant	Date											
	16.03.07				19.03.07				23.03.07			
	H	Leaf size		Unifor mity	H	Leaf size		Unifor mity	H	Leaf size		Unifor mity
		L	I			L	I			L	I	
V ₁ (w)	39.8	33.5	12.6	3	41.4	35.9	13.2	3	42.7	37.1	13.7	3
V ₂	34.3	27.5	10.4	2	36.3	30.5	11.4	2	38.1	32.7	12.2	2
V ₃	32.4	32.1	12.2	1	34.7	33.4	12.3	1	36.3	35.1	13.1	1
V ₄	42.7	34.4	13.1	5	44.2	35.7	13.6	5	47.2	37.2	14.1	5
V ₅	38.9	33.9	12.9	4	41.6	34.6	13.0	4	43.3	36.8	13.6	4

Table 2

The influence of nutritive substrates on tomatoes transplants growing and development

Variant	Date											
	23.03.07				26.03.07				02.04.07			
	H	Leaf size		Unifor mity	H	Leaf size		Unifor mity	H	Leaf size		Unifor mity
		L	I			L	I			L	I	
V ₁ (w)	29.3	12.4	3.2	2	31.4	14.3	5.4	2	42.5	27.5	8.5	2
V ₂	24.2	10.2	3.1	1	29.6	14.1	5.1	1	37.5	27.5	7	1
V ₃	31.2	13.7	4.2	4	34.9	17.1	6.4	4	42.5	25	8.5	4
V ₄	30.4	13.1	3.9	3	32.2	15.6	5.9	3	40	30	8.5	3

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