IMPROVED METHODS OF OBTAINING PEPPER SEEDLINGS

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Abstract
This paper refers to the effect of different types of pots on the level of growth and development of the pepper seedlings in order to clarify the influences caused by use of different recipes transplanters pots. Different biocomposites from renewable resources biodegradable nutritive support were studied. Seedlings were grown in 4 variants of pots M1 (V1), M2 (V2), M3 (V3) and jiffy- pots (V4). The height of the aerial part varied from 14.5 (V1) to 17.4 cm (V4), whereas the root length varied from 5.4 (V1) to 12.6 cm (V4). The number of leaves ranged from 7 (V2) to 12 (V4). The total volume was lowest for V2 (1.5 cm^3) and highest for V4 (2.5 cm^3), but the root volume was lowest for V2 (0.5 cm^3) and highest for V1 (1 cm^3). V2 also resulted in the smallest total seedling mass (1.6 g) aerial part mass (1.1 g) and root mass (0.5 g). Excepting the root volume V4 had the greatest values for the studied indicators.

Keywords: pepper, seedlings, pot, biodegradable

1. INTRODUCTION

Biodegradable nutrient supports based on cellulose fibers and peat with protective and stimulating materials added is higher form of transplant used in current for plant seedlings producing technologies.

Development of biodegradable nutritive supports technology is based on sustainable development principles and objectives, taking into account the whole life cycle of product: it uses the raw materials natural, renewable and recyclable and additives based on natural modified polymers that assure nutritive substances for plants developments; their degradation products constitute the soil fertilizers.

2. MATERIAL AND METHOD

This is an experiment with one factor - type of pot, with 4 graduations:
V1 – M1- pot recipe M1 (70% peat T + corrugated cellulose + 2% chemical fertilizers);
V2 – M2- pot recipe M2 (55% peat T + 30% corrugated cellulose + 15% marc);
V3 – M3- pot recipe M3 (70% peat T + 30% corrugated cellulose);
V4 – control, jiffy-pot.
Were used 10 plants for each repetition and a total of 60 plants.
- Cosmin pepper seedlings- variety of Romanian long pepper, with 55-60 cm plants tall, vigorous shrub with 3-4 branches. Pendent fruit, sheath type, conical-oblong, with pointed and thin-skinned, veiled surface, deep red at physiological maturity, sweet, juicy, flavorful, for fresh consumption, weighing between 70-110 g, 2 -3 edges, with the average height of the fruit - 14.5 cm and 4-7 cm diameter. Pericarp thickness is 4.8-5.8 mm. Maturation is gradual and production potential is 32-43 t / ha. Shows good resistance to VMT and middle to VMC and *Verticillium dahliae*;
- Poiana Stampei peat- T, of a Romanian origin, was extracted from a natural deposit, located in the village Poiana Stamps, Suceava, 18 km south-west of Worcester in northern Moldavia, the peat bog Pilugani. It is a fibrous peat that has not benefited from preconditioning before its introduction in the receipts manufacture process;
- Terracult peat of Dutch origin, is a professional and universal peat use in crop production, plain or mixed with other organic or inorganic;

- Secondary cellulose fiber (scrap of cardboard)- Cellulose is a major constituent of the vegetal materials and the most abundant organic material present in nature, the main source of carbon and energy for soil microflora and is degraded only by microorganisms capable of cellulases producing. Generally, organic substances of vegetal origin have a high resistance to biological degradation. It develops slowly and usually requires intervention of a large number of microorganisms. Over 200 species of microorganisms produce cellulases and have ability to degrade cellulose. Given the resistance to degradation, in recent years, cellulose was introduced as support material for carrying out different types of biodegradable pots used in the plant production for the containerized plant material production (Velicica Davidescu et al., 2008).
- Grape marc Romanian origin is residual organic material (husks and stalk) of wine production activity. Davidescu Velicica and al., 2002, show beneficial effect of grape bostina presence in the substrates used for production of planting material by different methods in several species dendrological. This effect is due to both agrochemical content, but the fact that the residual organic material comes with a number of other favorable characteristics, such as useful microbiological load (wine yeast and specific noble fermentation bacteria), but also phytohormons and vitamins.

In order to test the influence of new variants of pots on seedlings seedling growth and development sowing has been done on May 14. Seeding was done in wooden boxes filled with nutrient mixture composed of 40% fermented manure, 30% fallow land, 20% peat and 10% sand (Popescu V., Atanasiu N., 2010; Uleanu F. et al, 2008).
Experimental culture was established with transplantation, on May 28.

Figure 1. Seedlings transplanted in experimental pots corresponding to studied variant

Pots filled with nutrient substrate were placed in boxes lined with polyethylene to prevent nutrients washing with splashing water. Throughout the experimental period were applied appropriate seedlings care works which consisted of daily ventilation, watering, weeds weeding.

3. RESULTS AND DISCUSSIONS

Results on seedling growth are presented in Table 1 and Figures 2-5, where you can notice that of new pot recipes favorable influence on plant growth in peppers were made in the variant M1 and M2. Compared to jiffy- control most determined indicators, new pots variants had lower values.

Table 1 Indicators of seedlings growth at the planting time (2009)

Variant	Aerial height- (cm)	Root length - (cm)	Number of leaves	Total volume (cm^3)	Root volume (cm^3)	Total weight (g)	Aerial weight (g)	Root weight (g)
M1	14.5	5,4	8	2	1	1.7	1.1	0.6
M2	15.5	8.4	7	1.5	0.5	1.6	1.1	0.5
M3	14.8	10.4	10	2.3	0.6	2.3	1.7	0.6
Jiffy	17.4	12.6	12	2.5	0.8	2.8	2.0	0.8

Seedlings reacted quite differently to variations of pot in which transplantation was made. This can be attributed to incomplete, unbalanced supply, but also on the fact that studied pots had very low rate of biodegradation, causing installation of increased stress by the impossibility for the roots to cross their walls. This final aspect is correlated with excessive length of roots compared to the length of aerial part, also to excessive volume of plant roots. Values closer to the literature on plant growth were made in the M1 and M2 variants (Ciofu Ruxandra et al. 2003; 2004).

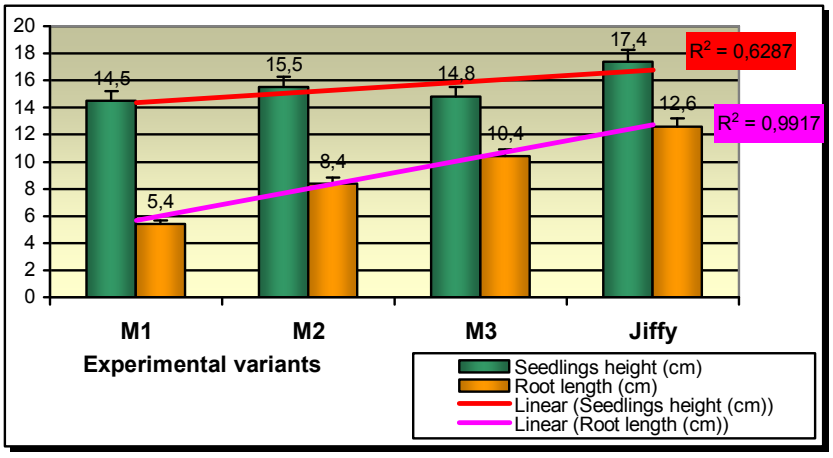

Figure 2. Influence of pot type on seedling growth (2009)

The height of the aerial part varied from 14.5 (V1) to 17.4 cm (V4), whereas the root length varied from 5,4 (V1) to 12,6 cm (V4) at the same variants. It appears that the type of pot has a great influence on both indicators, but more on root length ($R^2 = 0.9917$).

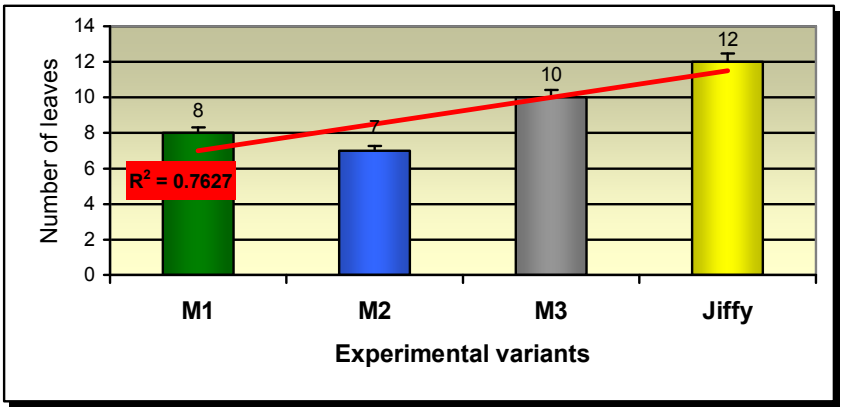

Figure 3. Influence of pot type on leaves number (2009)

The number of leaves of pepper seedlings is also influenced by the type of pot in which transplantation was performed (R^2 = 0.7627).The number of leaves ranged from 7 (V2) to 12 (V4).

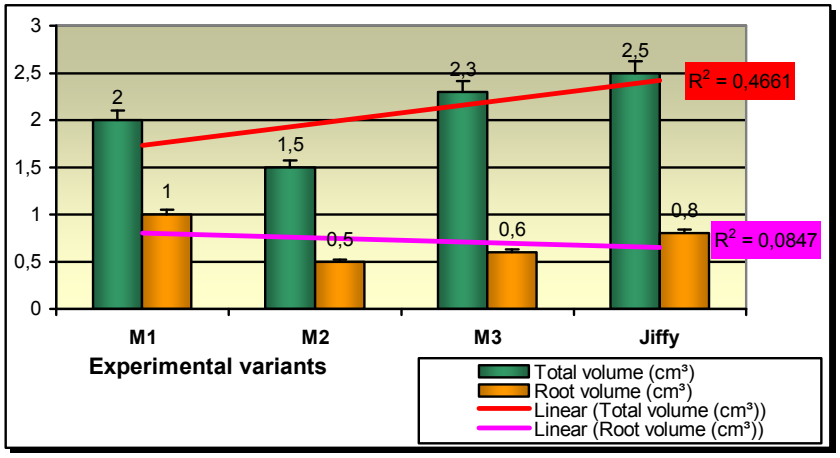

Figure 4. Influence of pot type on seedling volume (2009)

For the volume is found that the pot type of influence more total volume (R^2 = 0.4661) than that of root (R^2 = 0.0847). The total volume was lowest for V2 (1.5 cm^3) and highest for V4 (2.5 cm^3), but the root volume was lowest for V2 (0.5 cm^3) and highest for V1 (1 cm^3).

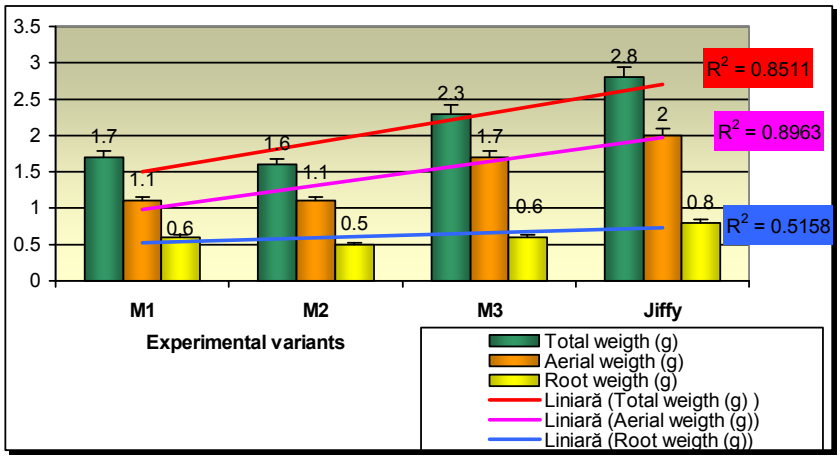

Figure 5. Influence of pot type on seedling weight (2009)

V2 also resulted in the smallest total seedling mass (1.6 g) aerial part mass (1.1 g) and root mass (0.5 g). It appears that the pot type has a great influence on the total mass and aerial part mass, but less than the root mass (R^2 = 0.5158).

4. CONCLUSIONS

- Among the new pots recipes, favorable influence on growth of pepper plants were made in the M1 variant;
- Excepting the root volume V4 had the greatest values for the studied indicators;
- For the seedling stage type of pot affects the number of leaves constantly, while root volume is determined largely by genetics and studied range;

- To have economic efficiency is recommended to use pots with fertilizer added to their walls.
- In order to test in production conditions recommends establishing biodegradable pots with a smaller thickness slightly, about 250-300 g/m^2 and a higher biodegradation rate, creating optimal conditions for developing a strong root system but found in a positive balance with the air.

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