RESULTS ON THE EFFECT OF DIFFERENT TYPES OF ROMANIAN NATIVE PEAT BIO COMPOSITES POTS ON SEEDLING GROWTH

Florina Uleanu*

*University of Piteşti, Department of Environmental Engineering and Applied Engineering Science, Str. Târgu din Vale, nr. 1, 110040, Piteşti, România, E-mail: uleanuflorina@yahoo.ro

Abstract
Seedlings production is an important link in vegetable culture because many vegetables species are grown by producing prior of seedlings. The theme work is in line with Western trends to produce seedlings by integrating new vegetables technologies, profitable, with positive effect on limiting pathogens to obtain seedlings, using biodegradable pots. Were conducted various observations and measurements on plants when they have reached the optimum phase for planting. We have determined: height of seedlings, root length, leaf number, root volume total weight, weight of the aerial and weight of roots. The obtained data was calculated and considered as average / variant.

Keywords: seedlings, pots, peat

1. INTRODUCTION

Using different types of biodegradable pots are an alternative to traditional methods of producing seedlings with good results in protecting vegetable seedlings and plants with beneficial effects on production, its quality and economic efficiency of crops.

2. MATERIAL AND METHOD

This experiment was conducted over two years, 2009 and 2010. It is an experiment with one factor. The investigated factor is the type of pot in which they were transplanted pepper seedlings of the Cosmin variety. In 2009 were investigated 3 kinds of pots made of different materials:

Ml: - Poiana Stampei peat
- secondary cellulose fiber (scrap of cardboard) (Velicica Davidescu et al., 2008)
- Kymene 611 resin (commercial product)
- chemical auxiliaries (urea, dibasic ammonium phosphate, ammonium molybdate, sodium borate, zinc sulfate, copper sulfate, potassium nitrate)

M2: - Poiana Stampei peat
- secondary cellulose fiber (scrap of cardboard)
- grape pulp (pomace) (Davidescu Velicica and al., 2002)
- Kymene 611 resin (commercial product)

M3: - turbă Poiana Stampei
- secondary cellulose fiber (scrap of cardboard)
- Kymene 611 resin (commercial product)

In 2010, based on results obtained in 2009 were used the following materials to achieve pots:

Mch 2010: - Poiana Stampei peat - T;
- Terracult peat;
- secondary cellulose fiber (scrap of cardboard);
- Kymene 611 resin (commercial product);
- chemical auxiliaries;
- Chitosan.

3. RESULTS AND DISCUSSIONS

Seedlings reacted quite differently to variations of pot in which transplantation was made in 2009. 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.

Table 1 Indicators of seedlings growth at the planting time

Variant	Aerial height- (cm)	Root length - (cm)	Number of leaves	Root volume (cm^3)	Total weight (g)	Aerial weight (g)	Root weight (g)
M1	14.5	5,4	8	1	1.7	1.1	0.6
M2	15.5	8.4	7	0.5	1.6	1.1	0.5
M3	14.8	10.4	10	0.6	2.3	1.7	0.6
Mch 2010	15,2	7,9	5,8	1,00	1,8	1,1	0,70

Values closer to the literature on plant growth were made in the M1 and M2 variants. In terms of seedling growth in 2010 from table data it can be observed that growth indicators have values that enable compliance with the limits of suitability indicators pursued, according to data from specialized literature (Tabel 2).

Table 2 Technical data quality of peppers seedlings (Ruxandra Ciofu and colab. 2003, 2004)

Character	Pepper
Height (cm)	15-17
Diameter (mm)	5-6
Number of leaves	6-8
Leaves color	dark green

In terms of development, in 2010, weight indicators show accumulation that allowed ensuring normal growth. Unfortunately, in this regard, the literature does not provide classification limits due to the fact that, for the same species in culture, there is a very diverse assortment including the growth, development and production potential.

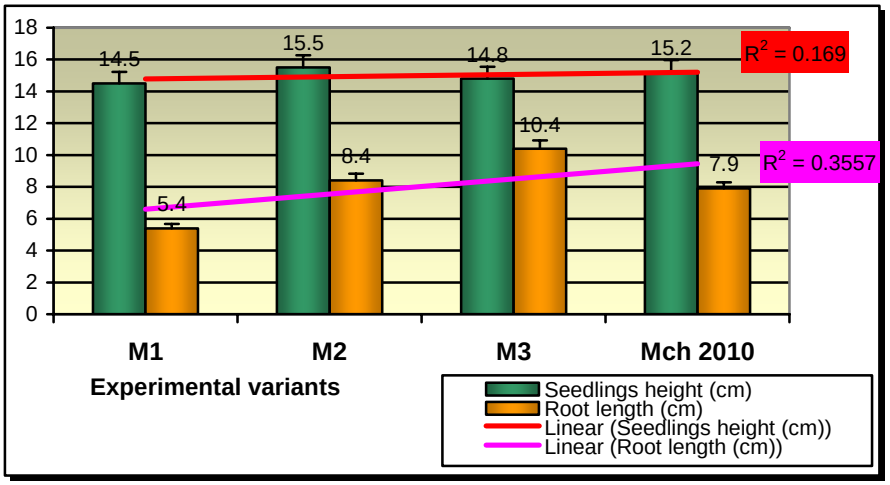

Figure 1 Influence of pot type on seedling growth (cm)

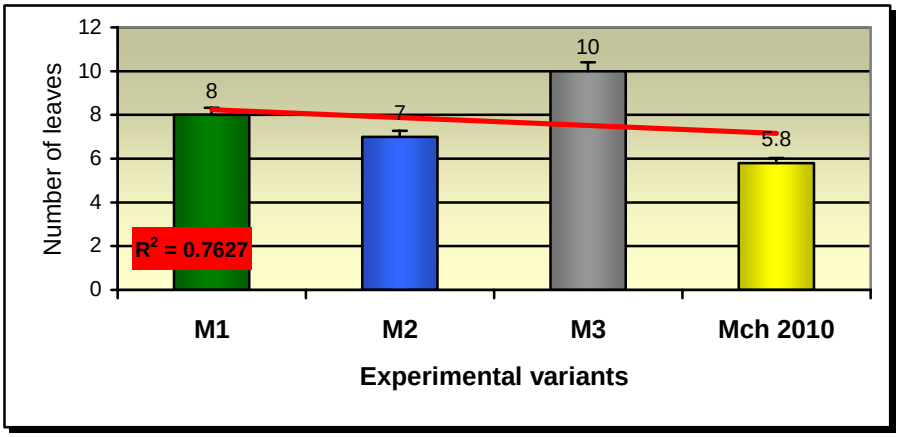

Figure 2 Influence of pot type on leaves number

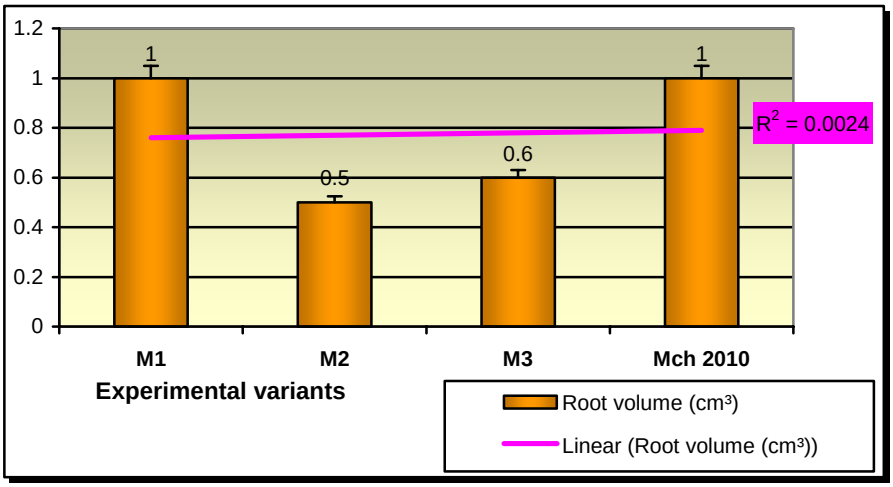

Figure 3 Influence of pot type on seedling volume

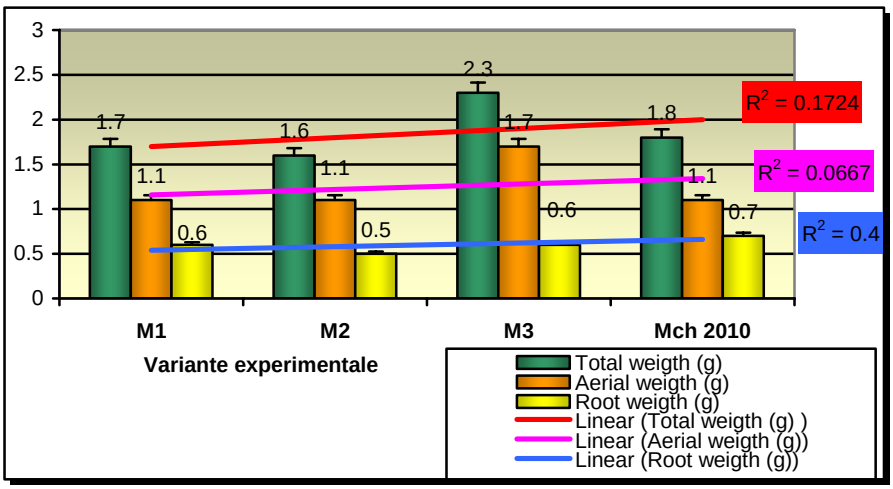

Figure 4 Influence of pot type on seedling weight

As a result of visual assessment, it was found that good status is linked to good seedling root penetration through the walls of pots, even if their actual biodegradation was rather small. This we believe is principally related to the mechanical properties of pots, and in particular the penetration resistance.

4. CONCLUSIONS

- Speaking of growth, in general, in the experience of 2009, the plants have reacted very differently and in a chaotic way to the culture conditions, and the type of pot. This may be due to a incomplete, unbalanced supply, and the fact that studied pots had a very low rate of biodegradation, causing installing stress phenomena because the root were unable to cross their walls. The latter is correlated with exaggerated length of roots compared to the length of the aerial and also to the exaggerated root volume.
- Among the new pots recipes, favorable influence on growth of pepper plants were made in the M1 variant;
- 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.
- In terms of development, in 2010, weight indicators show that allowed accumulation ensuring normal growth.
- As a result of visual assessment, it was found that good status is linked to good seedling root penetration through the walls of pots, even if their actual biodegradation was rather small. This we believe is principally related to the mechanical properties of pots, and in particular the penetration resistance.

6. REFERENCES

Ciofu Ruxandra, Nistor S., Popescu V., Chilom P., Apahidean S., Horgoş A., Berar V., Lauer K.F., Atanasiu N. (2003, 2004) - Tratat de legumicultură. Editura Ceres, Bucureşti

Davidescu Velicica, Costea Gabriela, Madjar Roxana, Stanica Florin, Caretu Georgeta (2002) Substraturi de cultura. Ed. Ceres, Bucureşti

Davidescu Velicica, Roxana Madjar, Cristina Mănescu (2008) Valorificarea unor deşeuri reciclabile în cultura containerizată a unor specii dendrologice. Editura Invel Multimedia, Bucureşti.