SOME STUDIES REGARDING FLOWER CULTURE USING ORGANIC SUBSTRATES

CERCETĂRI PRIVIND CULTURA PLANTELOR FLORICOLE PE SUBSTRATURI ORGANICE

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Abstract. *The aim of this research was to use mixtures of organic substrates obtained from the composts formed from different waste materials at the Hydrangea macrophylla Ser. culture in containers. The experiment was made in the greenhouse of the University of Agronomic Sciences and Veterinary Medicine-Bucharest. Transplants were made on different mixtures formed from manure, peat, and sand and forestry leaves compost. Then, the transplants were introduced in 5 l containers. The pots were filled with 4 variants of volumetric mixture and 10 replicates formed with forestry leaves compost, peat, garden soil, sand respectively red peat. The research on Hydrangea macrophylla Ser. culture using waste composts has the limitation of pH and the high content of macro elements from substrates. The concentration of macro elements from plants varied with the substrates composition and vegetation period. The highest values of nitrogen were registered in variant 4 with 45% of leaves compost and the accumulation of element increase from the first period of analysis to the third. Phosphorus accumulated in small quantities. Potassium, an element that determines the quality of the flowers, was accumulated in values which varies from 2.96 to 3.6% with the highest values on the first period of analysis. These studies represent a new direction in the reuse of some waste materials on the culture of flowers.*

Rezumat. Cercetările efectuate au urmărit comportarea plantelor cultivate în containere pe diferite rețete de substraturi realizate prin dozarea volumetrică a componentelor: compost de frunze, turbă roşie, pământ de grădină şi nisip. Butaşii au fost înrădăcinați pe un substrat alcătuit din turbă roşie, compost de frunze şi nisip, fasonați după înrădăcinare la 10cm lungime şi plantați fiecare în containere de capacitate de 5l conținând substratul fiecărei variante (în număr de 12 plante/variantă). În cursul perioadei de vegetație s-au aplicat lucrările de îngrijire specifice (udări) şi tratamente fitosanitare pentru combaterea dăunătorilor. Au fost urmărite în dinamică evoluția indicilor agrochimici ai substraturilor, conținutul N, P, K forme totale în frunze şi măsurători biometrice (înălțimea plantelor, numărul de frunze şi lungimea lăstarilor, diametrul florilor). Rezultate semnificative privind creşterea şi dezvoltarea plantelor s-au obținut la varianta 3 cu 20% turbă roşie, 30% pământ de grădină, 40% compost de frunze şi 10% nisip în substrat.

Hydrangea is one of the most beautiful plants, which blooms, in forced culture, from March until May, bearing flowers with big, white, pink or blue floral bracts. Hydrangea plants are cultivated outdoors, in frost protected places, and in gardens where they bear flowers from June until October. In the garden, they grow under partial shade, having a very pleasant decorative aspect (Davidescu and colab., 2001, Selaru, 1998).

The purpose of this research was to obtain hydrangea plants in the container culture using some substrates result from mixing different residual materials and classic materials and to determine the optimum substrate for this culture.

MATERIAL AND METHODS

The experiment was made in the greenhouse of University of the Agronomic Sciences and Veterinary Medicine-Bucharest. Transplants were made on different mixtures formed from manure, peat, sand and forestry leaves compost. Then, the transplants were introduced in 5 l containers. The pots were filled with 4 variants of volumetric mixture and 10 replicates formed with forestry leaves compost, peat, garden soil, sand respectively red peat (table 1). During the vegetative periods, biometric measurements and analyses of plants and substrata were made.

RESULTS AND DISCUSSIONS

At the beginning there were made the analyses on the substrata used in the culture. The results are presented in table 1.The pH values for the each variant were between 6.22 and 6.48, soluble salts content varied between 0.13% and 0.39%, content, which does not represent a problem for the hydrangea plants because the optimum values are between 0.3-0.5%. The content of nutritive elements presents optimum values of nitrogen and potassium, but smaller values of phosphorus.

Table 1.

Agrochemical characteristics of substrates at transplanting of shoots

Variant	pH	Soluble salts total content %	Content, ppm			
			NH_4^+	NO_3^-	PO_4^{3-}	K^+
Red peat:Garden soil:Sand 45%:45%:10%	6.22	0.39	24.37	570	3.5	210
Red peat:Garden soil:Leaves compost:Sand 30%:30%:30%:10%	6.48	0.13	14.6	266	2.3	185
Red peat:Garden soil:Leaves compost:Sand 20%:30%:40%:10%	6.30	0.30	20.6	301	2.8	196
Red peat:Leaves compost:Sand 45%:**45%**:10%	6.31	0.23	29.25	271	3.3	205

During the vegetation period, the substrata and the leaves from the experimental variants were analyzed.

The **values of nitrogen** from the substrata show a different release of that element during the period of vegetation. In all the variants, the values are high because the components of the substrata suffer a composting process together with the release of nitrogen. All the variants have values of nitrogen, which are upon the values of variant 1 (control). The highest value of 318.5ppm is in variant 4 (Red peat: Leaves compost: Sand 45%:**45%**:10%) which have 45% of leaves compost.

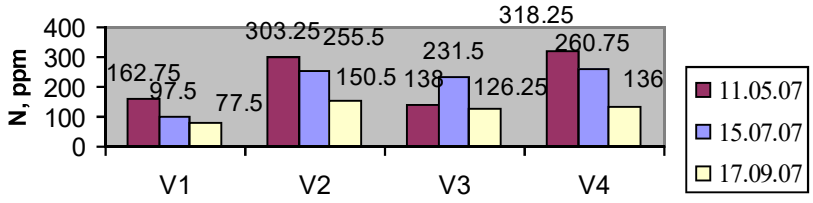


Fig.1- Evolution of nitrogen in culture substrata

Fig.2- The influence of substrata on the quantities of nitrogen from leaves

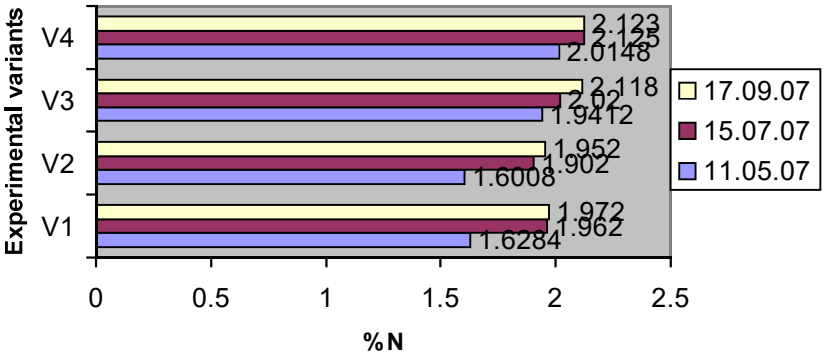
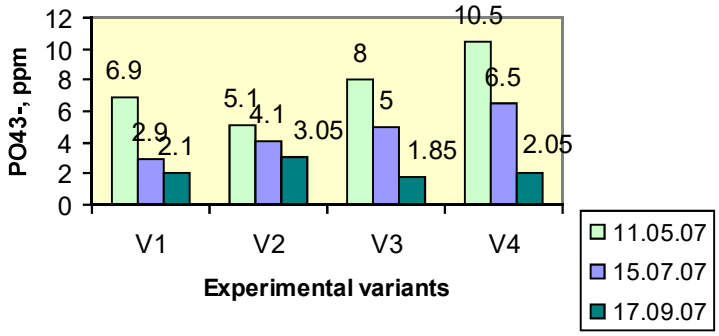


Fig.3- Evolution of phosphorus in culture substrata

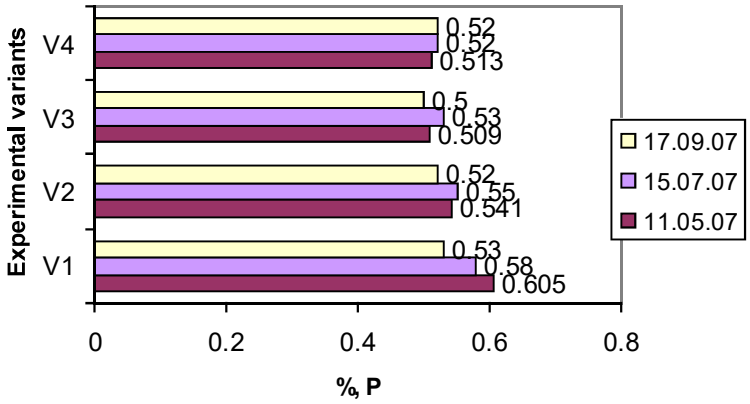


The analysis of nitrogen from the leaves of *Hydrangea macrophylla* shows a minimum limit of 1.600% in variant 2, analysis from May to a maximum value of

2.125% in variant 4 from July analysis. The nitrogen quantity from leaves depend with the supply of that element in substrata. The maximum values of nitrogen are in variant 4 in which the quantity of nitrogen from the substrata is the highest from all variants.

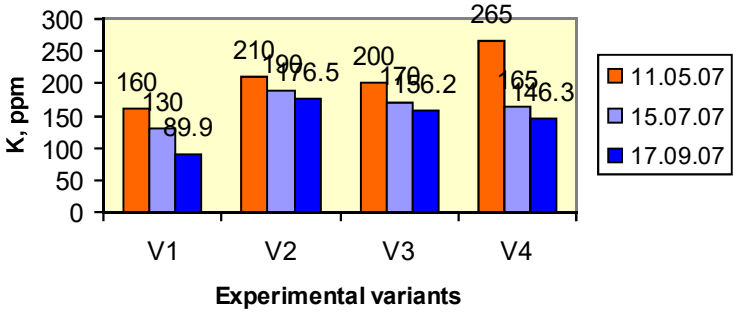
From the point of **phosphorus**, the values of that element in the substrata during the vegetation period are small and could influence the development of plants. The highest value was registered in variant 4 with the value of 10.5ppm. The release of that element shows that the maximum values are at the first period of analysis and that the values of that element decrease until very small values of 1.85% at variant 3 to 3.05% at variant 2 in May.

Fig.4-Influence of subtrata on the content of phosphorus from leaves



The concentrations of phosphorus in the leaves are low and are from 0.50% to 0.605%. The accumulation of that element in *Hydrangea macrophylla* leaves is at the same level at all periods of analysis and variants because the quantities of that element from the substrata are low from the beginning and during the vegetation period.

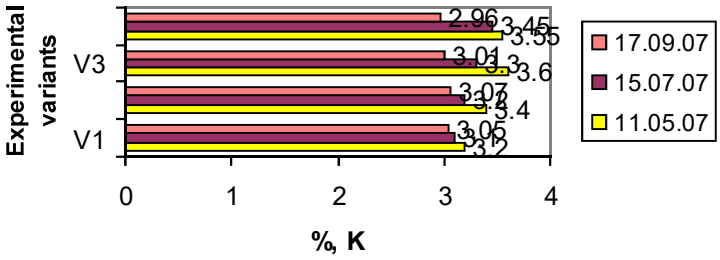
Fig.5-Evolution of potassium in culture subtrata



Potassium, the other important macro element registered high values at all periods of analysis, and varies from 89.9ppm at variant 1 in September to 265ppm in variant 4 in May. The highest values are in variant 4 where the substrata release the

highest quantities of potassium. These values of the potassium were accumulated during the vegetation periods on the leaves of the *Hydrangea macrophylla* from the experimental variants the 4 variant registered the highest values (3.55%) of potassium in leaves of plant and 3.6% at variant 3.

Fig.6- Influence of substrata on the potassium content in leaves



To see the influence of N, P, K content of the substrata there were made corelations between the content of every element from substrata and content of the same elements from hydrangea leaves at all period of analyses. The results were presented in figures 7 and 8.

Fig.7- Correlation between nitrogen from substrata and nitrogen in leaves

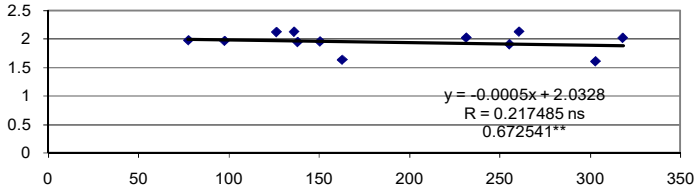
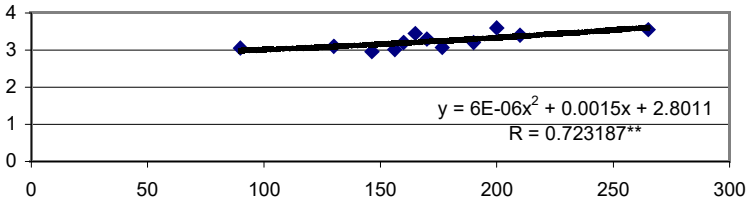


Fig.8- Correlation between potassium from substrata and potassium from leaves



The correlations betweem the macro elements contents from experimental substrata and contents of the same elements in hydrangea leaves shows that the absorbtion of nitrogen and potassium are very significant.

CONCLUSIONS

1. The leaves compost content of substrata influence the composition in N, P, K of mixture;

2. The content in macro elements of *Hydrangea macrophylla* leaves is positively influenced by the content in the same elements from substrata:

a. **Values of nitrogen** from the substrata show a different release of that element during the period of vegetation, in all the variants, the values are high because the components of the substrata suffer in time a composting process. The highest value of 318.5ppm is in variant 4 (Red peat: Leaves compost: Sand 45%:**45%**:10%).The maximum values of nitrogen from *Hydrange macrophylla* leaves are in variant 4 in which the quantity of nitrogen from the substrata is the highest from all variants

b. From the point of **phosphorus**, the values of that element in the substrata during the vegetation period are small and could influence the development of plants. The highest values are registered in variant 4 with the value of 10.5ppm. The concentrations of phosphorus in the leaves are low, from 0.50% to 0.605%.

c. **Potassium** from substrata registered high values at all period of analysis, and varied from 89.9ppm to 265ppm. The highest values are in the variant 4. From the experimental, variants the 3 variant registered the highest values of potassium in leaves of plant at variant with 405 leaves compost.

REFERENCES

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