OBSERVATIONS REGARDING MULTIPLICATION ON VEGETATIVE METHODS OF *TAXUS BACCATA* L. SPECIES IN IAŞI COUNTY CONDITIONS

CERCETĂRI PRIVIND PRODUCEREA DE MATERIAL SĂDITOR PE CALE VEGETATIVĂ LA *TAXUS BACCATA* L. ÎN CONDIŢIILE JUDEŢULUI IAŞI

BERNARDIS R.[1] , SANDU Tatiana[1],Dascălu M.[1], , ZLATI Cristina[1], PAŞCU Roxana[1], POŞTA Daniela [2],
*Corresponding author e-mail: mdascalu2000@yahoo.com

Abstract. *Among the multitude of conifers found in green spaces is found the Taxus genus. The species of the genus Taxus are of particular importance in the arrangement of green spaces and especially in the conditions from us in the country which are generally favorable and very favorable for these species. The purpose of the paper is to highlight the potential for breeding through cuttings of the most known species, namely Taxus baccata L., which is found in Iasi county. Observations were made regarding the optimal timing for the cuttings, determining the influence of the culture substrate on the cuttings and establishing the rhizogenous substance Radistim 2 on the cuttings that were subjected to treatment.*
Key words: cuttings, substrate, root biostimulators

Rezumat. *Între multitudinea de conifere întâlnite în cadrul spaţiilor verzi se regăseşte şi genul Taxus. Speciile genului Taxus au o importanţă deosebită în amenajarea spaţiilor verzi şi mai ales în condiţiile de la noi din ţară care sunt în general favorabile şi foarte favorabile pentru aceste specii. Scopul lucrării este de a pune în evidenţă potenţialul de înmulţire prin butaşi a celei mai cunoscute specii, respectiv Taxus baccata L., care se întâlneşte în judeţul Iaşi.*
S-au efectuat observaţii privind stabilirea momentului optim pentru realizarea butaşilor, determinarea influenţei substratului de cultură asupra butaşilor şi stabilirea substanţei rizogene Radistim 2 asupra butaşilor de tisă ce au fost supuşi tratării.
Cuvinte cheie: butaşi, substrat, biostimulatori de înrădăcinare

INTRODUCTION

Landscaping is one of the basic components of green areas that ensure the aesthetic aspect of towns.

Among the many species of coniferous trees among ornamental shrubs, the species belonging to the genus Taxus are very important for the landscaping

[1]University of Agricultural Sciences and Veterinary Medicine Iasi, Romania
[2]Banat's University of Agricultural Sciences and Veterinary Medicine Timişoara

of green areas and the weather conditions in our country are generally favourable and very favourable for this species (Iliescu, 2002).

The necessity of the diversification of the plant assortment is imposed as a priority taking into account the diversity of the biological material and especially the achievements on international level (Bernardis, 2010, Cioltan *et al.,* 1989; Mihail M., 2005; Zaharia D., Dumitraş Adelina, 2003).

MATERIAL AND METHOD

The experiment was carried out in the greenhouse „Moara de Vânt", Iaşi. The biologic material used to carry out the experiment comprised woodified cuttings of *Taxus baccata* L. (fig.1)

Fig.1 *Taxus baccata* L.

The saplings were harvested on 15.03.2018, and their preparation and setting for planting were done on the same day. The saplings used in the experiment were 10 cm long, were planted on cross beams, and the thickness of the planting layer was 15 cm. The planting of the saplings in the planting layers comprising: powder perlite (Mt); grain perlite + sand (1:1); powder perlite + peat coal (1:1) was done in holes, which had been previously opened by a planter.

The planting distances were 7 cm between the rows and 5 cm on the row, and the plantingdepth was approximately 2/3 of the sapling length. To ensure the humidity of the planting layer and to maintain the turgescence of the saplings tissues, watering was done manually, using a watering can. During the vegetation period, phytosanitary treatments were applied tomaintain the health of the saplings, using fungicides (Topsin, 0.1%). During the period the experiment was carried out, the planted saplings were the beneficiaries of care treatment and work such as: watering and phytosanitary treatment.

During the experiment, the following observations were made: - observations regarding the influence of the layer composition in three levels: powder perlite (Mt.); ground perlite and sand (1:1) and powder perlite and peat coal (1:1) –observations regarding the influence of thetreatment with Radistim 2: treated and untreated saplings. The experiment was type 3*2, with 6 variables, in

2 repetitions, 15 de saplings each/ repetition. The variables were displayed following the method of subdivided lots.

Table 1

Experimental variables to produce saplings

Variable symbol	Variable name
V_1a	Powder perlite, non-treated saplings (witness)
V_1b	Powder perlite, treated saplings
V_2a	Grain perlite and sand (1:1), non-treated saplings
V_2b	Grain perlite and sand (1:1), treated saplings
V_3a	Powder perlite and peat coal (1:1), non-treated saplings
V_3b	Powder perlite and peat coal (1:1), treated saplings

To be able to respond to the objectives of the experiment, we have made a series of observations, quantity recordings, and biometrical measurements on the biologic material involved in the experiment. Thus, we have made measurements and determinations regarding:

- the percentage of saplings rooted (number of rooted saplings out of the total of saplings planted on variables);
- the average number of roots per sapling;
- the average lengthof the sapling roots.

To determine the average length of the root on the sapling, we have measured each root and we related the sum to the number of roots. Based on these measurements, we have determined: - the influence of the culture layer on the saplings; -the influence of Radistim 2 substance on the saplings. The method of processing the data obtained when the saplings were rooted was the mathematical method of data processing, by percentage relation of thedata.

RESULTS AND DISCUSSIONS

Taxus baccata L. is to be found in almost all nursery gardens, as it has ornamental value and it also protects the environment. An extremely valuable method of production is to multiply the species in a vegetative way, using saplings.

At the end of the rooting period we made measurements regarding the average length of theroots and the number of roots that grew on the saplings on each variable.

The gross data has been processed and interpreted from a statistic point of view, following the influence of the layer and of the Radistim 2 substance on the rhyzogenesis of the yew saplings. Rhyzogenesis is the organogenesis phenomenon most involved in vegetative multiplication. In the study of rhyzogenesis, what needs to be considered is the interaction of many factors, among which the most dominant is the hormonal adjustment caused by the dynamics of auxins in organogenesis. As regards the unilateral

influence of the layer on the number of roots, it was observed that all variables had negative differencesin relation to the witness (tab. 1).

Table 1

The influence of the layer composition on the averagenumber of roots on the *Taxus baccata* L. saplings (average)

Variable symbol	Variable name	Average number of roots		Difference	Difference significance
V1	Powder perlite	9,65	100.0	Mt.	
V2	Grain perlite and sand (1:1)	8,45	87.60	-1,2	00
V3	Powder perlite and peat coal (1:1)	8,95	92.70	-0,7	00
DL5% = 0.30 DL 1% = 0.58 DL 0.1% =1.17					

The average number of roots was influenced by the composition of the used layer. Thus, the witness variable was the highest in number, i.e. 9.65. The variable of grain perlite and sand was the one that obtained the lowest average number of roots, 8.45 with a difference of – 1.2 to the witness. The variable of powder perlite and peat coal had a difference of – 0.7 to the witness (tab. 2). With the non-treated variables, the average numbers of roots was lower than the witness, differences being of -1.4 with the grain perlite variable and of -0.7 with the powder perlite and peat coal (tab. 2).

Table 2

The influence of the layer composition on the average number of roots on the *Taxus baccata* L. saplings.

Variable symbol	Variable name	Average number of roots		Difference
		No	%	
V1a	Powder perlite, Mt.	9.2	100	Mt.
V2a	Grain perlite and sand (1:1)	7.8	84.8	-1.4
V3a	Powder perlite and peat coal (1:1)	8.5	92.4	-0.7

With the non-treated variables, there were small differences to the witness variable, theaverage number of roots being very little influenced by the used layer (tab. 3).

Thus, the greatest number of roots with the treated variables was reached on powder perlite layer, i.e. 10.1 with a difference of 0.9 to the witness. The grain perlite and sand layer was the one that had the lowest average number of roots of 9.1 with a difference of – 0.1 to the witness variable. The powder perlite and peat coal variable did not have any differences to the witness variable (tab. 3).

Table 3

The influence of the layer composition on the average number of roots on the *Taxus baccata* L. saplings

Variable symbol	Variable name	Average number of roots		Difference
		No	%	
V1a	Non-treated powder perlite, Mt.	9.2	100	Mt.
V1b	Treated powder perlite	10.1	109.8	0.9
V2b	Grain perlite and sand (1:1),	9.1	99.0	-0.1
V3b	Powder perlite and peat coal (1:1)	9.2	100	

CONCLUSIONS

According to the data that was recorded and analysed, at the end of the rooting period the following facts were ascertained:

1. A very good percentage of 90% was obtained with the rooting of the non-treated saplings on a layer of black forest soil + sand (1:1), with a difference of 50% to the Prut river sand layer;
2. By using the rhyzogenetic stimulator, a percentage of 100% was ensured in combination with the layer of black forest soil + sand (1:1), which influenced the rooting of the previous situation;
3. The layer of grain perlite + sand (1:1) has influenced significant positive increases in the length of the radicular system of the non-treated *Taxus baccata* saplings;
4. The combination of the studied factors has influenced the average number of roots, with the rooted samplings there being positive values recorded with the V_4 variables (on a layer of grain perlite + sand 1:1, with a difference of 13.30 roots to Prut river sand, V_6 on a layer of black forest soil + sand 1:1, with a difference of 10.20 roots to Prut river sand.

It was observed that the layer ensures a triple percentage and a double percentage with the number of the saplings roots, treated or non-treated with the rhygenetic biostimulator.

The success of a great number of saplings depends on the obtained roots which will adapt to the conditions in the nursery garden.

REFERENCES

1. Bernardis R., 2010 – *Arboricultură ornamentală.vol.1.* Editura Ion Ionescu de la Brad, Iaşi
2. **Cioltan G., Cioltan Angela, 1989** –*Tisa.* Editura Ceres, Bucureşti.
3. Iliescu Ana Felicia, 2002 – *Cultura arborilor şi arbuştilor ornamentali.* Editura Ceres, Bucureşti.
4. Mihail M., 2005 – *Dendrologie.* Editura "Bioterra", Bucureşti.
5. Zaharia D., Dumitraş Adelina, 2003 – *Arboricultură ornamentală.* Editura „Risoprint" , Cluj-Napoca.