THE INDUCEMENT OF THE ROOTEDNESS PROCESS OF *THUJA OCCIDENTALIS WOODWARDI* CUTTING USING RADISTIM TYPE BIOACTIVE SUBSTANCES

Vlad Mariana*

**University of Oradea, Faculty for environmental Protection, 26 General Magheru Street, 4100848, Oradea, Romania; mariana_popvlad@yahoo.com*

Abstract

Creating beauty by landscaping new green areas, as well as maintaining and modernizing the old ones, remain a major duty of specialists, in a continuos but never finished evolution.

In the conditions of continuing extension of the city, of industrial expansion and of the road traffic's intensification, the care for beauty and usefulness becomes a duty of modern urbanism.

The specialist have the duty to enrich the assortment of the landscaping species, to complete the knowledge about the decorative plants, arboreal and shrubbery ones, about associating the plants to fulfill many functions, to elaborate and promote modern metodhs of yielding planting material, to organize and take care of city gardens.

In present it is known as a decorative plant cultivated in field. In areas with less favorable climatic conditions where the minimal temperature goes down during winter below the resistance limit, they are cultivated in pots placed outdoor during the summer and indoor during the cold season. In our country Thuja occidentalis woodwardi is not very spreaded because of the shortage of cuttings caused by the low rate of multiplication. In order to increase the efficiency of multiplication on vegetative way, between 2008-2010, in the gren houses from Oradea we have watched over the Thuja occidentalis woodwardi cuttings rootedness process using stimulating substances of Radistim type.

Keywords: *Thuja occidentalis woodwardi*, rooting substrate variants, cuttings

MATERIALS AND METHODS

There where inghathered cuttings semi-wooden 8-10 cm long. The experiment was organized in two variants: V_1-untreated standard and V_2-treatment with radistim 2, using 1000 cutting per variant in four different times.

Cutting planting for striking roots has been made in perlit with 1-1.5 mm particles, placed on the parapet with a thickness of substratum of 12-14 cm. The treatment was made before planting. First there was renewed the humidity staus. Then the cuttings were inserted in the powder stimulating substance (radistim 2) with 1-2 cm of their root.

The cutting were planted for striking roots in the first decade of Mai. The distance between cuttings was 6x6 cm and the depth was 2-3 cm. The soil was well ramed in order to remove the air from the rootedness zone.

During the rootedness period the temperature oscillated between 18-27 celsius degrees in air and 20-21 celsius degrees in substratum. The

substratum's humidity was 65-75% of total capacity of retaining and the relative humidity was 75-85%.

The light was directed by covering the cuttings with paper and the windows of the green house were whitewashed once the growing process started. For the variants differentiation there were made observations and determinations concerning the lenght of rootednees period, the proportion of rooted cuttings and the dimensions of new formed roots.

RESULTS AND DISCUSSIONS

First roots appeard at closed intervals of time for the two variants with a slight advantage for the cuttings treated with Radistim 2.

The period of complete rootedness process last days (04.05-25.09).

After the striking root process the cuttings were dislocated from the rootedness substratum and they were passed in clay flower pots which have the diameter of 6-8 cm. In this pots the substratum is formed of: two parts peat, one part earth of leaves, one part compost and one part sand.

The number of rooted cuttings from the total cuttings planted for rootedness, for each variant registered growing values from 670 cuttings for V_1 (control, standard variant) to 783 cuttings for V_2 when the cuttings were treated with Radistim 2 (Table 1).

Table 1

The striking roots proportion of *Thuja occidentalis woodwardi* cuttings at Oradea's green houses (average values 2008-2010)

Variants	Number of rooted cuttings		±D	Semnification of the difference
	Absolute (pcs.)	Relatively (%)		
V_1-untreated standard (control variant)	670	100	-	-
V_2-treatment with Radistim	783	116.8	+113	xx

LSD 5% = 97
LSD 1% = 135
LSD 0.1% = 190

In relativals terms treatment with Radistim 2 increased the rate of cuttings striking roots with 16.8% comparatively with the untreated variant. From the statistic point of view this difference is considered as very meaningful.

The treatment with radistim 2 stimulates also the quality of rooted cuttings through the number and the dimension of the roots.

From table no. 2 arises that the average number of roots per cutting is growing from 8.3 pcs. at V_1-untreated, to 12.7 pcs. per cutting at V_2-treated with radistim 2.

In relativals terms the treatment with Radistim 2 increased the number of roots per cutting with 53% comparatively with the untreated variant. From the statistic point of view this difference is considered as very meaningful.

Table 2

Average number of roots per cutting (average values 2008-2010)

Variants	**Average number of roots**		**±D**	**Semnification of the difference**
	Absolute (pcs.)	**Relatively (%)**		
V_1-untreated standard (control variant)	8.3	100	-	-
V_2-treatment with Radistim	12.7	153.0	+4.4	xx

LSD 5% = 2.75
LSD 1% = 4.4
LSD 0.1% = 7.0

The increased capacity of striking roots arises also from the number and the thickness of the newly formed plants' roots.

From the tabel no. 3 we can see that the lenght and the thickness of *Thuja occidentalis woodwardi* cuttings vary between large limits with favor for those treated with Radistim.

Table 3

The lenght and the thickness of *Thuja occidentalis woodwardi* rooted cuttings (average values 2008-2010)

Variants	**The lenght of roots-extreme limits (cm)**	**Grouping the roots in accordance with its thickness**		**Total**
		Pes.<1 mm	**Pes. > 1 mm**	
V_1-untreated standard (control variant)	0.5-10	4.7	3.5	8.2
V_2-treatment with Radistim	0.8-14	6.9	4.8	11.7

For the control variant the newly formed roots registered variable lenght between 0.5 and 10 cm. For the cuttings treated with radistim 2 the values were higher, between 0.8 and 14 cm.

Grouping the newly formed roots in accordance with its thickness, for the roots with diameter smaller than 1 mm there were registered values in growth from 4.7 pcs. for V_1 to 6.9 pcs. for V_2. For the roots with diameter bigger than 1 mm there were registered values in growth from 3.5 pcs. for V_1 to 4.8 pcs. for V_2.

CONCLUSIONS

* *Thuja occidentalis woodwardi* as decorative species, with useful economic implications, can be multiplied through vegetative way by cuttings.

* The multiplication rate of *Thuja occidentalis woodwardi* through cuttings can be stimulated by using biocative substances of Radistim type.

* Stimulating the rootedness process of semiwooden cuttings of *Thuja occidentalis woodwardi* with bioactive substances of Radistim type guarantee a highly vegetative potential for newly formed plants.

* The stimulate substance Radistim increase the striking roots rate. So the treated cuttings stroke roots in proportion of 78.3 % comparatively to 67% for those untreated.

REFERENCES

1. Anderkerk Th. G. L. (1990). Salt tolerance of ten woody ornamentals. Abstr. Of the XXIIIth International Horticultural Congress, Firenze.

2. Albarede M. (1992). La mise en bac d'un arbore adulte. Revue Horticole, avril.

3. Boutherin D., Bron G. (1999). Multiplication des plantes horticoles, Ed. Tehnique et Documentation Lavoisier, Paris.

4. Bush-Brown (1995). Garden Book, Charles Scribners's Sons, USA.

5 Cantet A. (1999). Pepiniere d'ornement et fruitiere, Ed Bailliere et Filis Paris.

6. Cuisance P. (1992). Les arbustes d'ornement, Ed. Floraisse Larouse, Paris.

7. Enescu V, Ioniță L., Paladă Nicolau M. (1994). Înmulțirea vegetativă a arborilor forestieri, Ed. Ceres, Bucureşti.

8. Foucard J. (2004). Filiere Pepiniere, TEC-DOC Lavoisier, Paris.

9. Gorastarzu, B. (2002). Bacetrisation des substrates et mychoryzation centrale, L horticulture Francaise, mars.

10. Harris W. (2006). Arboriculture Syllabus.Departament of Enviromental Horticulture, University of California Davis, USA.

11. Hay, R. And Synage P. (2007).2000 fleures, plantes et arbustes, Ed Oyez, Leuven, Belgique.