

THE INDUCEMENT OF THE ROOTEDNESS PROCESS OF *VIBURNUM DAVIDII* CUTTING USING RADISTIM TYPE BIOACTIVE SUBSTANCES

Ioan Vlad*, Mariana Vlad, Ioana Meșter, Szilard Bartha, Raluca Vlad

*University of Oradea, Faculty for environmental Protection, 26 General Magheru Street, 4100848, Oradea, Romania; ioanvlad2006@yahoo.com

Abstract

Viburnum davidii is a shrub cultivated as decorative plant for its small, lasting and shining leaves, oval-elongated (7-9cm/2.5-4.5 cm), with short tail (0.5-1.5 cm) and for the various colored sepals (pink, red, violet) gathered around the yellow flowers with no decorative value.

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 *Viburnum davidii* 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 green houses from Oradea we have watched over the *Viburnum davidii* cuttings rootedness process using stimulating substances of Radistim type.

THE MATERIAL AND WORK METHOD

There were ingathered cuttings semi-wooden 8-10 cm long. The experiment was organized in two variants: V₁-untreated standard and V₂-treatment with radistim 2, using 1000 cutting per variant in four different times.

Cutting planting for striking roots has been made in perlite 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 status. Then the cuttings were inserted in the powder stimulating substance (radistim 2) with 1-2 cm of their root.

The cuttings were planted for striking roots in the first decade of May. 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 length of rootedness period, the proportion of rooted cuttings and the dimensions of new formed roots.

RESULTS AND DISCUSSIONS

First roots appeared 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 57 days (04.05-30.06).

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 604 cuttings for V₁ (control, standard variant) to 742 cuttings for V₂ when the cuttings were treated with Radistim 2 (Table 1).

Table 1

The striking roots proportion of *Viburnum davidii* 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)	600	100	-	-
V ₂ -treatment with Radistim	750	125	150	xxx

LSD 5% = 10.21 LSD 1% = 20.4 LSD 0.1% = 30.7

In relativals terms treatment with Radistim 2 increased the rate of cuttings striking roots with 25% 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 pcs. at V₁-untreated, to 11.6 pcs. per cutting at V₂-treated with radistim 2.

In relativals terms the treatment with Radistim 2 increased the number of roots per cutting with 45% 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	100	-	-
V ₂ -treatment with Radistim	11.6	145	3.6	x

LSD 5% = 3.52 LSD 1% = 6.92 LSD 0.1% = 9.16

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 *Viburnum davidii* cuttings vary between large limits with favor for those treated with Radistim.

Table 3

The length and the thickness of *Viburnum davidii* rooted cuttings
(average values 2008-2010)

Variants	The length 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)	0.4-9.5	4.5	3.5	8.0
V ₂ -treatment with Radistim	0.5-12.7	7.2	4.8	12.0

For the control variant the newly formed roots registered variable length between 0.4 and 9.5 cm. For the cuttings treated with radistim 2 the values were higher, between 0.5 and 12.7 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 4.5 pcs. for V₁ to 7.2 pcs. for V₂. For the roots with diameter bigger than 1 mm there were registered values in growth from 3.5 pcs. for V₁ to 4.8 pcs. for V₂.

CONCLUSIONS

* *Viburnum davidii* as decorative species, with useful economic implications, can be multiplied through vegetative way by cuttings.

* The multiplication rate of *Viburnum davidii* through cuttings can be stimulated by using biocative substances of Radistim type.

* Stimulating the rootedness process of semiwooden cuttings of *Viburnum davidii* 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 75 % comparatively to 60% for those untreated.

REFERENCES

1. Bush-Brown (1995). Garden Book, Charles Scribners's Sons, USA.
2. Contet A. (1999). Pepiniere d'ornement et fruitiere, Ed Bailliere et Filis Paris.
3. Foucard J. (2004). Filiere Pepiniere, TEC-DOC Lavoisier, Paris.
4. Enescu V, L. Ioniță, M.Paladă Nicolau (1994). Înmulțirea vegetativă a arborilor forestieri, Ed. Ceres, București.
5. Jhenesen H.(2004). Le grand livre international des arbres, Ed. F. Nathan, Paris.
6. Krussman G. (1998). Die Laubgehölze. Verlag Paul Parey, Berlin.
7. Krussman G. (2005). Die Laubgehölze. Verlag Paul Parey, Berlin.
8. Mailliet L.(2003). Arboriculture urbaine, Institut Pour le developement forestier , Paris
9. Stanică F., M. Dumitraș ,V. Davidescu,R. Madjar, A. Peticilă(2002).Înmulțirea plantelor horticoale lemnoase., Editura Ceres. București
10. Stănescu V. (1977). Dendrologie, Universitatea din Brașov.
11. Vlad I. (2001). Arboricultură ornamentală, Editura Impriemriei de Vest, Oradea.