THE INDUCEMENT OF THE ROOTEDNESS PROCESS OF *MAHONIA JAPONICA* CUTTING USING RADISTIM TYPE BIOACTIVE SUBSTANCES

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Abstract

Mahonia japonica is a shrub cultivated as decorative plant for its small, lasting and shining leaves, oval-elongated (3-5cm/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 Mahonia japonica 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 2006-2010, in the gren houses from Oradea we have watched over the Mahonia japonica cuttings rootedness process using stimulating substances of Radistim type.

Keywords: *Mahonia japonica*, 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 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 652 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 *Mahonia japonica* cuttings at Oradea's green houses (average values 2008-2009)

Variants	**Number of rooted cuttings**		**±D**	**Semnification of the difference**
	Absolute (pcs.)	**Relatively (%)**		
V_1-untreated standard (control variant)	652	100	-	-
V_2-treatment with Radistim	783	120	+131	xxx

LSD5% = 25.6 LSD 1% = 50.7 LSD 0.1% = 82.4

In relativals terms treatment with Radistim 2 increased the rate of cuttings striking roots with 20% 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 9.6 pcs. at V_1-untreated, to 12.8 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 33% 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 2008-2009)

Variants	**Average number of roots**		**±D**	**Semnification of the difference**
	Absolute (pcs.)	**Relatively (%)**		
V_1-untreated standard (control variant)	9.6	100	-	-
V_2-treatment with Radistim	12.8	133	+3.2	xx

LSD 5% = 2.8 LSD 1% = 3.10 LSD 0.1% = 4.52

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 *Mahonia japonica* cuttings vary between large limits with favor for those treated with Radistim.

Table 3

The lenght and the thickness of *Mahonia japonica* rooted cuttings
(average values 2007-2009)

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)	0.3-10.1	5.2	3.4	8.6
V_2-treatment with Radistim	0.4-14.5	6.8	5.0	11.8

For the control variant the newly formed roots registered variable lenght between 0.3 and 10.1 cm. For the cuttings treated with radistim 2 the values were higher, between 0.4 and 14.5 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 5.2 pcs. for V_1 to 6.8 pcs. for V_2. For the roots with diameter bigger than 1 mm there were registered values in growth from 3.4 pcs. for V_1 to 5.0 pcs. for V_2.

CONCLUSIONS

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

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

* Stimulating the rootedness process of semiwooden cuttings of *Mahonia japonica* 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 65.2% for those untreated.

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