

THE INDUCEMENT OF THE ROOTEDNESS PROCESS OF *HIPPOPHAE RHAMNOIDES* CUTTING USING RADISTIM TYPE BIOACTIVE SUBSTANCES

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Abstract

Hippophae rhamnoides is a shrub cultivated as decorative plant for its small, lasting and shining leaves, linear (3-6cm/2.0-2.4 cm), with short tail (1.5-2.5 cm) and for the various colored sepals (green) gathered around the yellow, red flowers with no decorative value. In our country *Hippophae rhamnoides* 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 2018-2019, in the green houses from Oradea we have watched over the *Hippophae rhamnoides* cuttings rootedness process using stimulating substances of Radistim type.

Key words: *Hippophae rhamnoides*, rooting substrate variants, cuttings

MATERIALS AND METHODS

There were gathered cuttings semi-wooden 10-15 cm long. The experiment was organized in two variants: V₁-untreated standard and V₂-treatment with radistim 2, using 500 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 3-5 cm of their root.

The cuttings were planted for striking roots in the first decade of May. The distance between cuttings was 5x5 cm and the depth was 4-6 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 appear 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 87 days (19.06-15.09).

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 10-12 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 350 cuttings for V₁ (control, standard variant) to 440 cuttings for V₂ when the cuttings were treated with Radistim 2 (Table 1).

Table 1

The striking roots proportion of *Hippophae rhamnoides* cuttings at Santandrei's green houses (average values 2018-2019)

Variants	Number of rooted cuttings		±D	Semnification of the difference
	Absolute (pcs.)	Relatively (%)		
V ₁ -untreated standard (control variant)	350	100	-	-
V ₂ -treatment with Radistim	440	125	90	xxx

LSD 5% = 30,1

LSD 1% = 51,4

LSD 0.1% = 87,7

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 10,5 pcs. at V₁-untreated, to 15,9 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 42% 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 2018-2019)

Variants	Average number of roots		±D	Semnification of the difference
	Absolute (pcs.)	Relatively (%)		
V ₁ -untreated standard (control variant)	10.5	100	-	-
V ₂ -treatment with Radistim	15.9	151,4	5,4	xx

LSD 5% = 4,3
 LSD 1% = 6,4
 LSD 0.1% = 9,6

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

From the table no. 3 we can see that the lenght and the thickness of *Hippophae rhamnoides* cuttings vary between large limits with favor for those treated with Radistim.

Table 3

The lenght and the thickness of *Hippophae rhamnoides* rooted cuttings (average values 2018-2019)

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)	0,5-11,4	3,9	8,4	12.3
V ₂ -treatment with Radistim	0.5-13,3	5,8	8,7	14,5

For the control variant the newly formed roots registered variable lenght between 0.5 and 11,4 cm. For the cuttings treated with radistim 2 the values were higher, between 0.5 and 13,3 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 3,9 pcs. for V₁ to 5,8 pcs. for V₂. For the roots with diameter bigger than 1 mm there were registered values in growth from 8,4 pcs. for V₁ to 8,7 pcs. for V₂.

CONCLUSIONS

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

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

* Stimulating the rootedness process of semiwooden cuttings of *Hippophae rhamnoides* 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 88% comparatively to 70% for those untreated.

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