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Stimulation of Striking Roots at the Cuttings of Laurel Tree (*Laurus nobilis*) with the Aid of Bioactive Substances of the Radistim Type

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Abstract

The laurel tree was first appraised as a decorative plant because of its persistent, glossy and agreeably nuanced leaves , as well as by its small yellow flowers grouped in panicles of an attractive aspect. This paper followed the effect of radistim on striking roots at the cuttings of *Laurus nobilis*, observing a considerably increase of the rate of striking roots as well as an enhancement of the quality of the rooting process proved through the number of roots per cutting. The stimulation of the laurel tree cuttings root striking with the aid of the biostimulators of the radistim 2 type ensures a superior vegetation potential for the newly formed plants. The work method elaborated at the glass houses complex of Oradea, may contribute to the extension of the laurel tree as a culture in Romania.

Keywords: *Laurus nobilis*, bioactive substances, cuttings, striking roots

Introduction

The laurel tree was first appraised as a decorative plant because of its persistent, glossy and agreeably nuanced leaves. One more proof as to the appreciation this species enjoyed even from ancient times is the fact that meritorious people or winners in sports contests were rewarded with crowns of laurel tree branches with leaves and fruit and at the moment when the spicy virtues of the leaves were identified, the appreciation quota increased significantly.

At present, the laurel tree is met as ornamental plant and of economic utility on a wide area, cultivated freely in open air or used from the spontaneous flora and, in areas with less favorable climate conditions, there where the absolute minimal temperature goes during winter time below the plants limit of resistance, it is cultivated in vegetation vases with preservation in open air during summertime and introduced in protected areas during unfavorable seasons. As apartment plant, the laurel tree may become attractive also by the multiple artistic forms which can be attributed to plants.

In Romanian though, the laurel tree is less spread as ornamental plant and of economic utility. Such a situation may be caused by the lack of planting material as a consequence of the low multiplication output as a characteristic of the species.

In order to increase the propagation output of the laurel tree through a vegetation way, between 2005-2006 at the nursery private property from Les-Bihor, the target was to stimulate the striking of roots by the use of riso-genesis stimulators of the radistim type.

Materials and methods

The cuttings used were semi-ligneous, 7-10 cm long. The experience included two variants: V1, untreated control and V2, treatment with radistim, using 400 cuttings by variant with 4 repetitions.

The striking root substrate was composed of equal proportions of crushed peat coal and perlite laid on the parapet in the glass house in a 12 cm thick layer. The treatment of the cuttings was performed before planting by prior moistening of the portion to be treated and then by its introduction in the stimulating substance (radistim 2) under the form of a powder, of about 1.5 – 2 cm.

The planting of the cuttings for root striking was done during spring in the first decade of the month of April at a distance of 5/5 cm, at a depth of 2.5 cm and with energetic compaction for the removal of aerated spaces in the root striking area. The ecologic striking roots conditions were represented by temperatures between ... - 230C in the air and 18-210C in the root striking substrate. The humidity in the substrate was variable, within the optimal limits of 65-75% of the total retention capacity and 75-89% of the relative one (Table 1). Light was directed by covering the cuttings with paper until the beginning of sprouts growth. For the differentiation of the variants followed up, observations and determinations were made as to the duration of

Tabel 1The evolution of temperatures and of the air humidity during root striking of *Laurus nobilis* cuttings

Date	2005		2006	
	Temperature of air (^{0}C)	Air Humidity (%)	Temperature of air (^{0}C)	Air Humidity (%)
1st of May	19	75	16	79
2nd of May	20	77	17	81
3rd of May	22	79	18	80
4th of May	23	81	19	83
5th of May	20	80	20	81
6th of May	21	83	22	82
7th of May	22	81	21	84
8th of May	21	87	20	83
9th of May	20	89	21	82
10th of May	19	88	19	86
Average	20.7	82.0	19.3	82.1

the rooting period, the proportion of the rooted cuttings, the number and dimensions of the roots formed.

Results and discussion

The callusing process at the base of the cuttings started at relatively close time intervals, with a slight advance in the case of the treated cuttings as compared to the untreated ones. The root striking period of the cuttings extended to almost 50 – 60 days. The rooted cuttings were dislocated from the parapet and planted in clay pots in a mixture composed of two parts peat coal, leaves-earth one part, two parts – celery earth and sand one part.

The number of rooted cuttings out of the 400 initially used by variant, recorded values increased from 218 pieces with the control variant to 148 pieces with the second variant, i.e. when cuttings were treated with radistim (Table 2).

Relatively speaking, the treatment with radistim 2 increased the rooting rate of the cuttings by 60% as compared to the untreated control. Statistically, the difference is very significant.Besides the increase of the rooting rate, the treatment with radistim significantly stimulates the quality "per se" of the striking roots process and that is shown by the number and dimensions of the roots. Thus, just as it results from table 3, the average number of roots by cutting recorded increased values from 6.1 pieces (roots) with variant 1, untreated control, up to 11.3 roots by cutting with variant 2, when the cuttings were treated with radistim. Relatively speaking, it results that the treatment with radistim increased the number of roots by 85% for one cutting, as compared to the untreated control, and from a statistical point of view, the difference is very distinctly significant. The effect of radistim in the increase of the rooting capacity of the laurel tree cuttings is also seen from the vegetation potential of the newly formed plants

Table 2 The ratio of striking roots at the cutting of laurel tree (Average values 2005 – 2006)

Variants	Number of rooted cuttings		± D	Significance of the difference
	Absolute (pcs.)	Relative (%)		
V1 (control)	218	100	-	-
V2 (treatment with radistim)	348	160	+ 130	***
DL 5% =				3.74
DL 1% =				5.45
DL 0.1% =				8.27

Table 3 Average number of roots per cutting (Average values 2005 – 2006)

Variants	Number of rooted cuttings		± D	Significance of the difference
	Absolute (pcs.)	Relative (%)		
V1 (control)	6.1	100	-	-
V2 (treatment with radistim)	11.3	185	+ 5.2	***
DL 5% =				3.1
DL 1% =				4.7
DL 0.1% =				7.1

Table 4 The lenght and the thickness for the rooted cuttings of laurel tree (Average values 2005 – 2006)

Variants	Length of roots in cm (extreme limits)	Grouping of roots according to thickness		Total
		Nb pcs. <1,0 mm	Nb pcs. >1,1 mm	
V1 (control)	0.4 – 6.8	2.2	3.9	6.1
V2 (treatment with radistim)	0.5 – 8.9	3.6	7.7	11.3

expressed by roots length and thickness.Just as it results from table 4, the roots length and thickness with the laurel tree rooted cuttings varies within broad limits, but they enjoy favorability for those treated in an initial phase with stimulation substances of the radistim type. With the control variant, the formed roots recorded variable lengths within the range of 0.4 and 6.8 cm whilst for the cuttings treated with radistim 2, the values were greater, between 0.5 and 8.9. According to the thickness with up to 1.0 mm in diameter, increasing values were recorded from 2.2 pieces with variant 1 (control) up to 3.6 pcs. with variant 2 treated with radistim, and roots with a thickness in excess of 1.1 mm recorded values of 3.9 pcs. with the untreated control variant and of 7.7 pcs. with variant 2 treated with radistim.

Conclusions

The laurel tree as an ornamental species and a plant with useful economic implications (through the value of the leaves as spices) may be propagated in a vegetative manner by cuttings.

The increase of the propagation rate by cuttings may be stimulated by the use of bioactive substances of the radistim type.

The stimulating substances of the riso-genesis process of the radistim type may ensure the increase of the rooting percentage of semi-ligneous laurel tree cuttings by 60%.

The stimulation of the laurel tree cuttings root striking with the aid of the bio-stimulators of the radistim 2 type ensures a superior vegetation potential for the newly formed plants.

The work method elaborated at the glass houses complex of Oradea may contribute to the extension of the laurel tree as a culture in our country.

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