# CONSIDERATION ON VEGETATIVE PROPAGATION FROM CUTTINGS IN PLANT TRAYS OF THE CULTIVAR *JUNIPERUS COMMUNIS* 'MEYER'

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Prezentat la 19 octombrie 2009

***Abstract.*** *Propagarea prin butaşi lemnificați se consideră una din cele mai importante căi ale horticulturii moderne. În articol se prezintă date privind particularitățile multiplicării vegetative prin butaşi în tăvi alveolate în funcție de perioada fenologică, substratul de rizogeneză şi biostimulatorul de înrădăcinare a cultivarului Juniperus communis 'Meyer'.*

***Cuvinte-cheie:*** *propagare vegetativă, butaşi lemnificați, tăvi alveolate, perioadă fenologică, substrat de rizogeneză, biostimulator de înrădăcinare, cultivar.*

## INTRODUCTION

Dendrological species, especially the coniferous, are generally slowly growing, that is why the nurserymen's preoccupation consists in to obtain planting material of high quality in a relative short time (Davidescu et al., 2001). Cutting propagation is perhaps the most fascinating as well as frustrating area of plant propagation. Cuttings that rooted in high percentage last year may not fared as well this year (Dirr and Heuser, 1987). The variables involved in successfully cutting propagation are numerous and success is not necessarily guaranteed from year to year.

Propagating plants from cuttings is as much an art as it is a science. The condition of the parent plant has a major influence on how long it takes a cutting to root, how many roots develop, or if it roots at all. Some of the factors affecting the actual rooting process have been identified and can be controlled through the science of horticulture (Whitcomb, 1988).

Under the vegetative propagation understands the propagation of plant which is produced with the aid of some parts drawed from vegetative organs of plant, so named cuttings. The specimens obtained by that way conserve the biomorphological characters and the heredity peculiarities of the species. For that reason, vegetative propagation found a large implementation in modern horticulture with a view to producing decorative planting material (Rubțov, 1961).

## MATERIAL AND METHODS

The investigations concerning the propagation from hardwood cutting in plant trays were performed in special greenhouses conditions, covered over by polyethylene and, which provided with fog system and evaporative cooling system for maintaining a moderate temperature and high humidity. The experience was performed in January, March 2007. The hardwood cuttings were drawed during two phases of vegetation: cuttings drawed during physiologically deeply resting vegetative period, in January and, cuttings drawed before the initiating active vegetation, the end of March.

The cultivar *Juniperus communis* 'Meyer' as biological material served.

Concomitantly, on the level with the experimentation of rooting percent in dependence of phenological period, during the cuttings were drawed, the influence of rooting media over the rooting percent, including the average number of roots/cutting were studied. Thus, follow three variants of rooting media were established: perlite - 100%, peat + perlite - 50% + 50%, sphagnum - 100%. As rooting hormone stimulator, follow variants of hardwood cutting treatment were established: $V_1$ - control, $V_2$ – IBA (indolebutyric acid) powder talc - 0, 1%. The treatments were performed by powdering the basis of cuttings. A single type of cuttings was used, specially, hardwood cuttings from two phases of vegetation: a) cuttings drawed during physiologically deeply resting vegetative period, in January and b) cuttings drawed before the initiating active vegetation, the end of March.

The experience involved two repetitions, for each variant of a repetition were included by 25 cuttings. The hardwood cuttings were sticked in plant trays provided for plant propagation. The bottoms of the plant trays was perforated for ensuring the drainage and proper aeration, ulterior the plant trays together with planted hardwood cuttings were placed in the greenhouses and fixed on the plastic support, which also improves the aeration of the cuttings, such avoiding its putrefaction.

The determinations and biometric measurements performed after extracting the cuttings consist in a) the number of rooted cuttings able for transplanting, b) the length of the primary root and c) the number of the primary root.

**Table 1**

*Juniperus communis* 'Meyer' rooting indexes in dependence on sticking period, rooting medium and, hormone treatment.

| *Juniperus communis* 'Meyer' | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Drawed period** | **Rooting medium** | **Variants** | **Number of drawed cuttings** | **Number of rooted cuttings** | **Percent of rooting cuttings** | **Average number of roots per cutting** | **Average length of roots per cutting** |
| **January** | Perlite - 100% | Control | 50 | 22 | 44 | 6,59 ± 0,41 | 3,95 ± 0,14 |
| | | Treated | 50 | 32 | 64 | 8,65 ± 0,33 | 4,98 ± 0,09 |
| | Peat + Perlite (1:1) | Control | 50 | 16 | 32 | 7,19 ± 0,36 | 4,76 ± 0,16 |
| | | Treated | 50 | 26 | 52 | 9,04 ± 0,26 | 5,53 ± 0,09 |
| | Sphagnum - 100% | Control | 50 | 12 | 24 | 7,5 ± 0,34 | 5,13 ± 0,16 |
| | | Treated | 50 | 21 | 42 | 9,87 ± 0,31 | 5,87 ± 0,09 |
| **March** | Perlite - 100% | Control | 50 | 40 | 80 | 6,3 ± 0,29 | 4,46 ± 0,10 |
| | | Treated | 50 | 49 | 98 | 8,19 ± 0,22 | 5,31 ± 0,06 |
| | Peat + Perlite (1:1) | Control | 50 | 37 | 74 | 6,81 ± 0,22 | 5,19 ± 0,10 |
| | | Treated | 50 | 46 | 92 | 8,72 ± 0,17 | 5,80 ± 0,06 |
| | Sphagnum - 100% | Control | 50 | 16 | 32 | 7,25 ± 0,32 | 5,43 ± 0,14 |
| | | Treated | 50 | 27 | 58 | 9,41 ± 0,23 | 6,15 ± 0,07 |

## RESULTS AND DISCUSSION

*The percent rooted cuttings in dependence of the hardwood rooting medium*. The best results and, very significant for the cultivar *Juniperus communis* 'Meyer', 98% or 49 units, were registered in the case of sticking the cuttings in the hardwood perlite - 100% medium, drawed before the initiating active vegetation the end of March and, using the rooting hormone stimulator IBA (indolebutyric acid) powder talc - 0, 1%, at the same time evidencing its favourable action, however the control cuttings, untreated and, drawed in the same phenological period constituted only 80% or 40 units. The hardwood cuttings drawed during deeply resting vegetative period achieved a rooting percent much than reduced, i.e. 64% or 32 units in the variant of treated cuttings and, 44% or 22 units in the case of those untreated (fig. 1, tab. 1).

In the case of another two variants of rooting media, the results were more reduced from the point of view of successfully rooting process, as follows:

peat + perlite - 50% + 50% (1:1) at the cuttings drawed and sticked in January the rooting percent constitutes 52% or 26 units in the case of those treated and, 32% or 16 units in the case of that untreated, but in March constituted 92% or 46 units at the treated cuttings and, 74% or 37 units those untreated (fig. 2, tab. 1) sphagnum - 100%, in January, 42% or 21 units at the treated cuttings and, 24% or 12 units in the

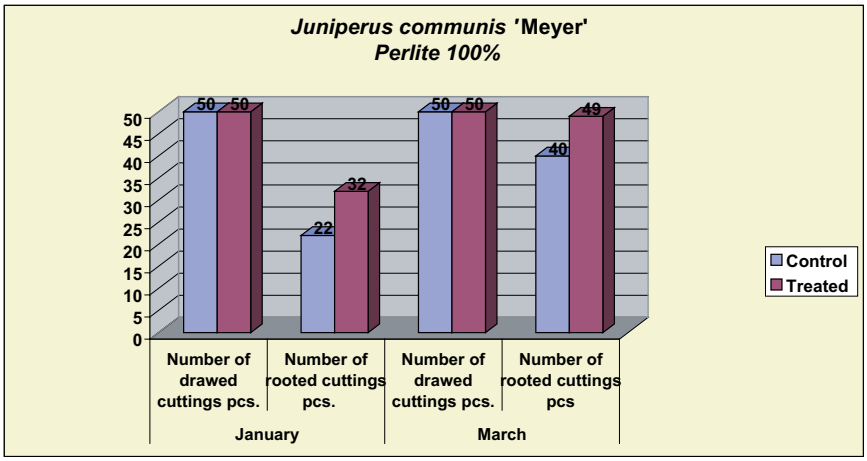


**Fig. 1.** Number of the rooted cuttings of *Juniperus communis* 'Meyer' sticked in Perlite 100% rooting media

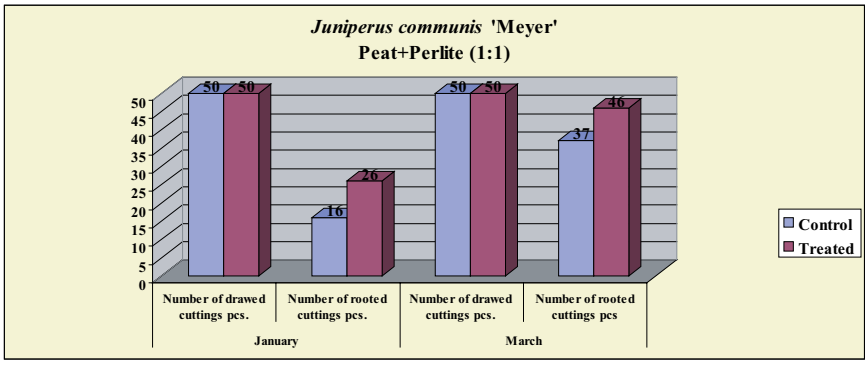


**Fig. 2.** Number of the rooted cuttings of *Juniperus communis* 'Meyer' sticked in Peat + Perlite 1:1 rooting media

control variant, in March 58% or 27 units the treated cuttings and, 32% or 16 units in the control variant (fig. 3, tab. 1).

*The average roots length.* Over all the variants of the treatment with IBA- powder talc were established the considerable growing of the average length of hardwood cuttings roots. The most important results were evidenced at the cuttings rooted in sphagnum - 100% rooting medium, drawed at the end of March, achieving the length of 6, 15 cm (fig. 4, tab. 1).

*The average number roots*. This important quality indicator of the cuttings was positive influenced at

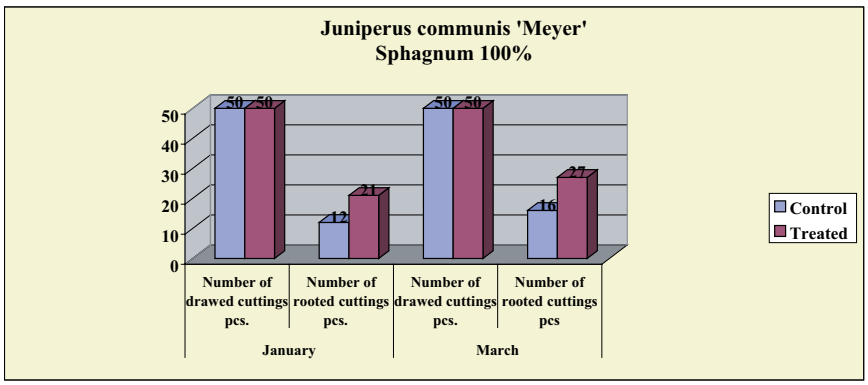


**Fig. 3.** Number of the rooted cuttings of *Juniperus communis* 'Meyer' sticked in Sphagnum 100% rooting media

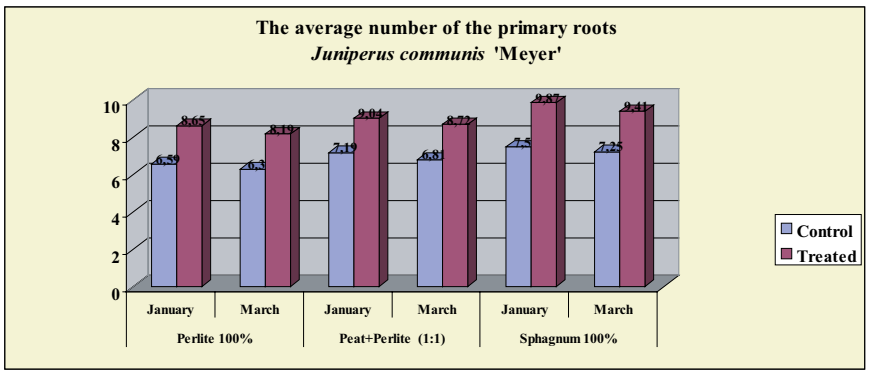


**Fig. 4**. The average number of the primary roots of *Juniperus communis* 'Meyer'

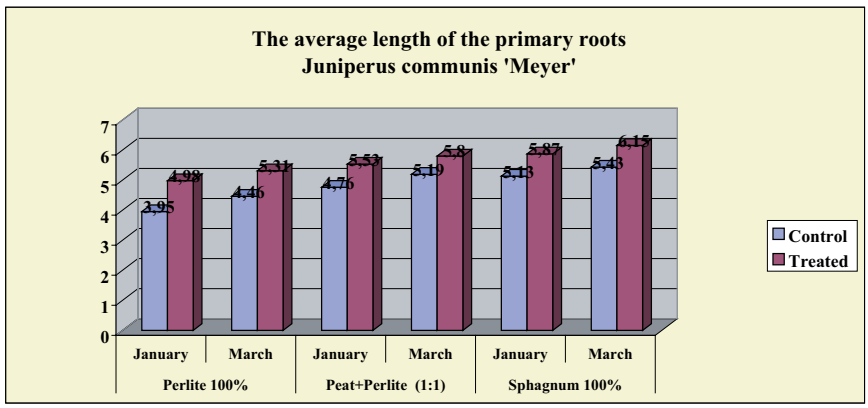


**Fig. 5.** The average length of the primary roots of *Juniperus communis* 'Meyer'

the tested cultivar *Juniperus communis* 'Meyer' by the treatment with the rooting hormone stimulator IBA powder talc, meantime, over the rooted cuttings in the sphagnum - 100% rooting medium, in the case of those hardwood cuttings during deeply resting vegetative period, i.e. January, the average number of roots achieving 9,87 root units/ cutting, this phenomenon being remarked in the case of another experimental experimented media (tab. 1, fig. 5).

## CONCLUSIONS

1. The highest rooting percent was established in the case of the rooting medium the variant perlite - 100%. Concomitantly, is established that the cuttings drawed and sticked at the end of March possess a higher rooting percent, comparatively with those sticked in January, event determined at all experimented studied rooting media. In conclusion, the optimal period of drawing the cuttings of the cultivar *Juniperus communis* 'Meyer' for rooting is the end of March.

2. In the case of treated cuttings with rooting hormone stimulator, the percent of rooting was higher, comparatively with those untreated.

3. The cuttings treatments with rooting hormone stimulator determine a good and considerable growing of the average number of the roots and of the average length of the roots, in conclusion the rooting quality increase.

4. The rooting media influences over the percent of rooting, and the number and the length of the roots. In our case, the rooted cutting in the rooting medium of peat + perlite - 50% + 50% (1:1) positively increases the number of roots, thus contributing to obtain of a high quality of rooting cuttings.

The achieved success was obtained due to the correct establishment of the moment for cutting gathering, its treatment with the rooting hormone stimulator, realizing of the greenhouses effect and, fog system, also ensuring of all agro-technical measures during vegetative multiplication of hardwood cuttings. The rooting resulted in all the tested variants of rooting media with variable rooting percentage. Obtained results concerning the rooting of the hardwood cuttings more than 70%, are very important so from the scientific point of view, receiving performing experimental data, in new pedoclimatic conditions for the R. Moldova, as for the horticultural practice, because is opening the way towards the industrial rooting cutting of the cultivar *Juniperus communis* 'Meyer'.

## BIBLIOGRAPHY

1. Davidescu V. şi alții. Substraturi de cultură. Bucureşti, Editura Ceres, 2001. 135 p.

2. Dirr M., Heuser Ch. Jr. The reference manual of woody plant propagation: From seed to tissue culture. Athens, Georgia, Varsity press, Inc. 1987. 239 p.

3. Rubțov Ş. Cultura speciilor lemnoase în pepinieră. Ediția a II-a, Bucureşti, Editura Agro-Silvică, 1961. 656 p.

4. Whitcomb C. Plant Production in containers. Stillwater OK. Lacebark Publications Inc. 1988. p. 633.