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RESEARCH ON THE VEGETATIVE PRODUCTION OF *PICEA PUNGENS* SEEDLINGS IN THE MIHAI VITEAZU NURSERY

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Abstract: In forestry nurseries, the vegetative propagation of seedlings is employed to faithfully transfer characteristics from the mother plant to the offspring, particularly for non-genetically fixed forms and varieties. Additionally, this method is used to expedite the production. Grafting is a method of vegetative multiplication, which in recent years has become widely used in forest nurseries, through the development of numerous execution techniques that have allowed adapting this method with very good results. Grafting involves joining two plant fragments - graft and rootstock - from two different plants of the same species, genus or family. The graft is a fragment of branch, which will be merged on a rootstock of 1, 2 or 3 years. Within the "Mihai Viteazu" Nursery there are various situations in which seedlings are produced vegetative, through grafting. The main purpose of this work is to study the vegetative production, by grafting, of seedlings of *Picea pungens* var. *Argentea*, using the lateral slit grafting, on two categories of rootstocks - 2 years old and 3 years old, and involves three categories of diameters - 4 mm, 6 mm and 8 mm. Experiments were initiated in the greenhouse of the "Mihai Viteazu" Nursery within the Turda Forestry District, at the beginning of February, 2023.

• Introduction

Conifers represent the essential ingredient of a garden, their effect being difficult to substitute with the help of other plants. Conifers often demonstrate resilience in different climates and serve practical purposes, such as acting as windbreaks and providing valuable timber resources. *Picea pungens* is an exotic species originating from North America (Rocky Mountains). In Romania it was introduced for ornamental purposes.

• Material and method

The analyses were conducted at the Mihai Viteazu Nursery, within the Turda Forestry District. The materials used included plastic pots, bamboo sticks, scissors and plastic wrap for grafting.

The main purpose was to obtain *Picea pungens* seedlings through side-veneer grafting (side-veneer approach) in pots. The scions were harvested on the day of grafting from nursery field, collected from young specimens.



Fig. 1. The stages of the grafting process in *Picea pungens* seedlings

• Results and discussions

The diameter of the 2-year-old rootstocks showed different values, with a range of variation between 4.93 mm and 8.10mm (Table 2.a). The diameter of the 3-year-old rootstocks showed different values, with a range of variation between 5.63 mm and 7.30 mm (Table 2.b).

	Diameter category	Average	sx	%	Dif.	Val "t"	Semnif.	CV%
a)	M ₁	4,93	0,15	71,7	-1,94	-7,09	ooo	13,29
	M ₂	7,58	0,10	110,3	0,71	2,82	**	5,78
	M ₃	8,10	0,40	118,0	1,23	2,65	**	22,27
	Average exp.(Mt.)	6,87	0,23	100,0	-	-	-	13,78
	*, **, *** / 0, 00, 000 Semnification for P<0.05, 0.01 and 0.001 (*, **, *** pozitiv; 0, 00, 000 negative)							
b)	M1	6,30	0,15	98,3	-0,11	-0,32	-	10,43
	M2	7,30	0,13	113,9	0,89	2,72	**	7,83
	M3	5,63	0,86	87,8	-0,78	-0,86	-	68,28
	Average exp.(Mt.)	6,41	0,30	100,0	-	-	-	28,85
	*, **, *** / 0, 00, 000 Semnification for P<0.05, 0.01 and 0.001 (*, **, *** pozitiv; 0, 00, 000 negative)							

Table 2. Summary of the results regarding the diameter of the 2-year-old rootstock (a) and 3-year-old (b)

Following statistical analyses, distinctly significant differences were noticed, with higher values in the M1 diameter category and significantly lower differences in the M3 diameter category.

	Diameter category	Average	sx	%	Dif.	Val "t"	Semnif.	CV%
a)	M1	7,90	0,20	126,6	1,66	3,24	**	10,58
	M2	5,40	0,89	86,4	-0,85	-0,84	-	65,82
	M3	5,43	1,14	87,0	-0,81	-0,66	-	72,36
	Average exp. (Mt.)	6,24	0,47	100,0	-	-	-	49,59
	*, **, *** / 0, 00, 000 Semnification for P<0.05, 0.01 and 0.001 (*, **, *** pozitiv; 0, 00, 000 negative)							
b)	M1	7,20	0,33	134,5	1,85	2,74	**	16,46
	M2	5,91	1,44	110,4	0,56	0,36	-	68,80
	M3	2,95	0,99	55,1	-2,40	-2,08	o	100,97
	Average exp. (Mt.)	5,35	0,59	100,0	-	-	-	62,08
	*, **, *** / 0, 00, 000 Semnification for P<0.05, 0.01 and 0.001 (*, **, *** pozitiv; 0, 00, 000 negative)							

Table 3. Summary of the results regarding the rootstock of the 2-year-old (a) and 3-year-old (b)

The experimental results indicate that graft success rates increase as the diameter of the scion decreases, reaching the highest success at the average diameter of 4 mm.

Conclusions

The experiments show that graft success rates increase with smaller scion diameters, peaking at an average of 4 mm. This suggests an optimal size for scion diameter, influencing successful grafting. Further research into the relationship between diameter and graft success could offer valuable insights, refining grafting techniques for better outcomes.