

**RESEARCHES BASED ON THE GROUND LABOUR ON LANDS  
WHICH ARE UNSUITABLE FOR AGRICULTURE AND SITUATED  
ON THE HILLS OF TULCEA ( NORTHERN DOBROGEA),  
REGARDING THE VEGETATION STATE OF THE FORESTRY  
SEEDLINGS**

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**Abstract**

*The researches were performed in U.P.IV Heracleea canton 26 Malcoci from O.S. Babadag and aimed the influence of the preparation of the ground on the forestry seedlings installed on grounds unsuitable for agriculture. The interpretation of the measurements was made for the same plantations after 1, 3 and 5 years from the planting. It highlighted that the modality of preparing the ground influences the growth in height of the seedlings.*

**Key words:** the preparing of the ground on the entire surface, the preparing of the ground in nests.

**INTRODUCTION**

The widening of the national forests has been one of the most important goals of the Romanian and international forestry. Within this context, there appeared in the forestry world, starting especially with the second half of the past century, the necessity of the restoration of the degraded or completely disappeared forest cover. At present it is considered that this action „...has the purpose to help the natural recovering processes of the vegetation in a manner whereby the composition, the structure, the biological diversity, the functions and the processes from a reconstructed forest will approximate as much as possible the ones of the original forest. (IUFRO, 2005).

Because of the necessity of the widening of the national forests, it is approved on the basis of H.G.2259/2004 for final use to ecological restoration by afforestation, of the lands from the agricultural land fund, found under the administration of the State Agency Domain, of the area of 142,59 ha, in the forestry fund public property of the state, administrated by the „Regia Națională a Pădurilor” ROMSILVA.

The assumed area is situated in the Northern Dobrogea, the hills of Tulcea and it is administrated by the „Direcția Silvică Tulcea”- „Ocolul Silvic Babadag”.

## MATERIAL AND METHOD

The study area is located on the grounds which are inapt for agriculture assumed on the basis of H.G. 2259/2004, grounds which were included in U.P.IV Heracleea and belong to O.S.Babadag. The researches which took place in the area consisted in comparing of the results regarding the maintenance, growth and development of the forestry cultures that are installed on the same type of soil and having the same afforestation pattern but settled on different prepared soils.

The works of preparing the soil consisted in the fully preparation of the soil through plowing and harrowing in two directions and the fragmentary preparation of the soil in nests of 60x80cm. The experimental surfaces taken into account have a total surface of 400 m<sup>2</sup> are composed of 4 stands of 100m<sup>2</sup> each and were installed on grounds with a declivity of 10° with sunny presentation.

The cultures from the experimental surfaces whose characteristics are being presented in Table 1 have been established on grounds which were prepared at the end of the summer and the actual planting was realized in the autumn of the year 2006. The works for filling the voids were made every spring, based on the results of the annual inspection from the previous autumn. For the execution of the maintenance works it was pursued that these to be executed in time beginning with May and finishing the late in August.

*Table 1.*

The characteristics and the allotment of the culture types based on the soil preparation

Nr. crt.	Parcel	Surface -ha-	Landform	Soil type	Afforestation pattern	Ground preparation
1	256C	1,00 ha	plateau	Kastaniozom mezocalcic	40Stb20Fr20Mj20Sl	plowing+ harrowing (V1)
2	251D	2,51 ha	plateau	Kastaniozom mezocalcic	40Stb20Fr20Mj20Sl	Nests (V2)
3	251B%	1,00 ha	plateau	Kastaniozom mezocalcic	100 Stb	plowing+ harrowing (V1)
4	250G%	1,00 ha	plateau	Kastaniozom mezocalcic	100 Stb	Nests (V2)
5	251E	3.47	plateau	Kastaniozom mezocalcic	100 Sc	plowing+ harrowing (V1)
6	251F	1.00	plateau	Kastaniozom mezocalcic	100 Sc	Nests (V2)

St.b- Greyish Oak, Fr- Common Ash, Mj- Flowering Ash, Sl-Oleaster, Sc- Accacia

The located test plots were kept the same on the entire period of the measurements. The planting pattern in all the variants is of 2x1 m, meaning 5000 seedlings/ha.

## RESULTS AND DISSCUSIONS

The data taken from the field were gathered as it follows: in the first year from the installation it was surveyed the percentage of maintenance, in the third and the fifth year from the installation it was surveyed the percentage of maintenance and the growth of the seedlings. The obtained data were analysed at the office through specific modalities, the main results of these works being centralized and presented further.

Related to the maintenance of the presented culture in Table 2 one can see that in the first year from the planting, the success of the cultures has been satisfactory with differences between cultures. The filling of the gaps effectuated in the following two years have made the success percentage to rise reaching a higher level.

*Table 2*

The success of the cultures after a season of vegetation based on the soil preparation

Species	The average success %		Semnificative Differences %	Vegetation state
	Plowed ground	Ground prepared in nests		
1	2	3	4	5
Greyish Oak (Q.pedunculiflora)	64	61,75	2,25	Good
Common Ash (Fraxinus excelsior)	87,5	90	-2,5	Very good
Flowering Ash (Fraxinus ornus)	62,5	67,5	-5,0	Good
Oleaster (Elaeagnus angustifolia)	92,5	80	12,5	Good
Accacia (Robinia pseudacacia)	71,0	72,5	-1,5	Very good

According to the centralized data in the current table one cannot draw a conclusion regarding how the seedlings took roots and maintained after a season of vegetation regarding the modality of soil preparation.

Therefore, after a season of vegetation the sustentation in viable condition of the planted seedlings doesn't depend on the preparation technology of the ground and the soil but rather on the quality and the condition of the seedlings, the transport and storage conditions, on the planting manner and on the soil water system, induced by weather conditions. The low, unsatisfactory success from the first year may be put on account of high temperatures and the lack of precipitation in the summer season which had lead to the withering and compromising of the installed cultures. The big and significant differences, with different signs which appear at the greyish oak and flowering ash, must be ascribed first to these causes.

The collected and analysed data for the plantation of the third year have been centralized in Table 3.

*Table 3*

The success, height and the vegetation state of the cultures after three years from the plantation based on the soil preparation.

Species	Success %		Semnificative differences	Growth in height (cm)		Semnificative Differences cm	Vegetation state
	Plowed ground	Ground prepared in nests		Plowed ground	Ground prepared in nests		
Greyish Oak (Q.pedunculiflora)	87.14	84.64	2.5	29,3	25,6	3,7	good
Common Ash (Fraxinus excelsior)	92.5	90	2.50	111,1	98,39	12,71	very good
Flowering Ash (Fraxinus ornus)	85	80	5.0	53,59	42,27	11,32	good
Oleaster (Elaeagnus angustifolia)	95	85	10.0	144,9	97,35	47,55	Very good
Accacia (Robinia pseudacacia)	90	88	2.0	165,62	128,92	36,7	good

From the centralized data in the above table there results the fact that the experimentation of the 5 species, in different conditions regarding the soil preparation shows that, after 3 years from the plantation there can be observed obviously differences, the differences being of the same sign. The average success after the filling of the gapes from the second year from the plantation was, whatever the soil preparation, maxim at the common ash (91,2%), followed by accacia (89%), greyish oak (85,9%) and oleaster (82,5%), all the species presenting a good success percent.

As for the growth in height of the species found in the test plots one can see a difference between the cultures installed on the ground plowed on the entire area, and the height of the cultures installed on the ground prepared in nests. One can see that the accacia installed on the plowed

ground has reached the proportion of proximity of the treetops of over 70% after three seasons of vegetation, while the accacia installed on nests hasn't managed to reach the proportion of proximity of the treetops of over 70% up to date.

*Table 4*

The success, the height, and the vegetation state of the cultures of 5 years from the plantation based on the soil preparation

Species	Success %		Semnificative differences %	Growth in height (cm)		Semnificative Differences Cm	Vegetation state
	Plowed ground	Ground prepared in nests		Plowed ground	Ground prepared in nests		
Greyish Oak (Q.pedunculiflora)	78.21	70.71	7.5	78.21	50.33	27.88	good
Common Ash (Fraxinus excelsior)	95	90	5	234.7	180.8	53.9	very good
Flowering Ash (Fraxinus ornus)	82.5	75	7.5	125.1	87.03	38.07	good
Oleaster (Elaeagnus angustifolia)	97.5	82.5	15	264.8	207	57.8	very good
Accacia (Robinia pseudacacia)	88	85.5	2.5				very good

After 5 seasons from the plantation one can see major differences at the 5 species taken into consideration, based on the soil and ground preparation. All the differences are of the same sign as much as for the success percent as for the height growth and diameter growth of the seedlings.

The maintenance percent of the seedlings after five years from the plantation is good, whatever the soil and ground preparation was, with a maxim percentage of 97,5% recorded by oleaster and a minimum of 70,71% recorded by the greyish oak.

The medium heights at the cultures from the plowed ground of the entire surface for the species common ash and oleaster have reached the proportion of proximity of the treetops of over 70% and have reached rather large heights compared to the same species where the ground was prepared in spaces. The species flowering ash records a slower growth because its terminal bud was burned by a late hoarfrost in the summer of 2009 and this caused the bifurcation of the species and even the formation of multiple tips, fact which would impose an individualisation for every species of flowering ash. One can observe that for all the species taken into account the significations between the averages regarding the soil and ground preparation.

## CONCLUSIONS AND RECOMMENDATIONS

Taking into account the above information and facts, we consider that there can be drawn some conclusions regarding the manner of maintenance and development of the forestry cultures based on the soil preparation.

The soil preparation affects the growth and the development of the forestry seedlings after a certain period of time.

During the first years from the installation the planted forestry seedlings undergo the adaptation which is not influenced by the soil preparing.

The choice of the soil preparation affects the period of realisation of the proportion of proximity of the treetops of over 70% and implicit reduces the number of maintenances.

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