

RESULTS OF INCREASED SEEDLINGS PER UNIT AREA IN THE ROBINIA PSEUDOACACIA SPECIES

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Abstract

Acacia (Robinia spp), as main genus in the forestry culture, presents special importance in our country, it distinguishes itself by a particularly dense wood used both in constructions and as fire wood. Aside from these two uses acacia also distinguishes itself by multiple other uses, such as: it is the most melliferous forest tree in our country, it can be successfully used in stabilising slopes respectively landslides, stabilising sand dunes in agricultural regions such as those from Valea lui Mihai in Bihor county, in the plain area for the formation of wind protection forest curtains of agricultural lands, hunting grounds.

At global level it joins the other species of plants capable of storing atmospheric carbon in trunk, branches and root and the soil on which it is cultivated is also enriched by the input of atmospheric nitrogen which the plant fixates in the soil via roots, forming nodosities of the Azotobacter type. It is known that in Romania the acacia generally prefers the warm regions, with gentle, long autumns, safe from early frosts. The specialized literature as well as the experience of the past years confirmed the fact that acacia is a capable and available species, a species which presents impressive advantages from the standpoint of biomass production in agroforestry systems.

For the forestation of a land surface, when we use the general planting scheme of 2x1(m), a number of 5000 plants/ha is necessary, upon establishing the agroforestry cultures for the production of wooden biomass this number of plants grows proportionally based on the adopted planting scheme, so that the final number of plants/ha used upon establishing such a culture doubles in the majority of cases.

Moreover one presents in the paper several legislative aspects regarding the commercialization of the reproductive forestry materials.

Key words: acacia, variety, rectissima, acacia culture, acacia biomass, protection curtains, identity certificate

INTRODUCTION

In Europe, by far the largest cultivator of acacia is Hungary, with 345.000 ha covered with this species (Németh, Molnár, 2005). According to the data published by Keresztesi (2013), at the end of the 80's, extensive surfaces cultivated with acacia were also found in the USSR (144.000 ha, mainly in Ukraine and Moldova), Romania (120.000 ha), France (100.000 ha), Bulgaria (58.000 ha), Yugoslavia (50.000 ha), Czechoslovakia (28.000 ha). In Asia, large acacia cultivators are the Republic of Korea (1,22 million ha) and China (1,0 million ha).

The sands and sandy soils in our country occupy approximately 400 000 ha. Of these over 100.000 ha are forested (largely with acacia). As a

result of the wind factor through the phenomenon of deflation (blasting) the sand was spread and the desert area extended greatly so that in the three counties of Oltenia (Olt, Dolj and Mehedinți), it ended up occupying circa 200.000 ha.

Data very recently published by Giurgiu (2005, 2013), Șofletea and Curtu (2000), Nețoiu (2012), Ciuvăț et al., (2013) consider that currently the surface occupied by acacia in Romania amounts to 250.000 ha.

In Romania, acacia is more and more requested for planting. The producers must be registered, must observe the model of the seeds' analysis bulletin and the produced material will have an identity certificate. According to Law no. 107 from 15/06/2011 regarding the commercialization of the reproductive forest materials, "The basic material may be approved and included in the National Catalogue of the basic materials only by the authority". Likewise, in chapter VIII, art. 37 one stipulates that "The reproductive forest material intended for commercialization may be imported only in accordance with the scheme of the Organization for Economic Cooperation and Development (OECD)".

For elements of evidence, description, identification specific to each species, the Ministry of Environment and Forests issued in 2012 the Order no. 945 - for the approval of the National Catalogue of the forest genetic resources and of the Technical Instructions regarding the durable management of the forest genetic resources, observing the Protocol of Association of Romania to the European Forest Genetic Resources Programme - EUFORGEN.

MATERIAL AND METHOD

The results presented in this paper were gathered in the period 2014 – 2016 at the Bărzani farm from Bârzești locality, Arad county.

The land intended for establishing the experimental field before the seeding operation was prepared according to the methodological norms for land preparation for such a work: soil tillage, seedbed preparation through the use of the disc harrow.

The seed used corresponded to STAS 1808-04 according to the Analysis Bulletin no. 3193, issued by the Laboratory for the analysis of the forest seeds quality Brașov, from the 19th of February 2014.

Seeding depth 4 cm, seeding norm 2,5 gr./1ml.

4 lots were established, with the following seeding schemes:

Lot 1	Lot 2	Lot 3	Lot 4
20x20x20x20	30x30x30x30	40x40x40x40	50x50x50x50x50



Fig. 1. Mechanised seeding of the lots from the Bărzani farm

During the vegetation period the four lots were monitored so that the necessary works, such as the application of the selective herbicides against weeds, respectively the cultivation of the land between the plant rows through hoeing, were carried out periodically and in due time.

One used neither fertilizers nor irrigation water before or during the plants' vegetation period.

After the vegetation period, the seedlings were harvested from the nursery and inventoried in 4 quality classes, based on their height and thickness at the base ring, the results thus obtained are graphically presented in figure 2.

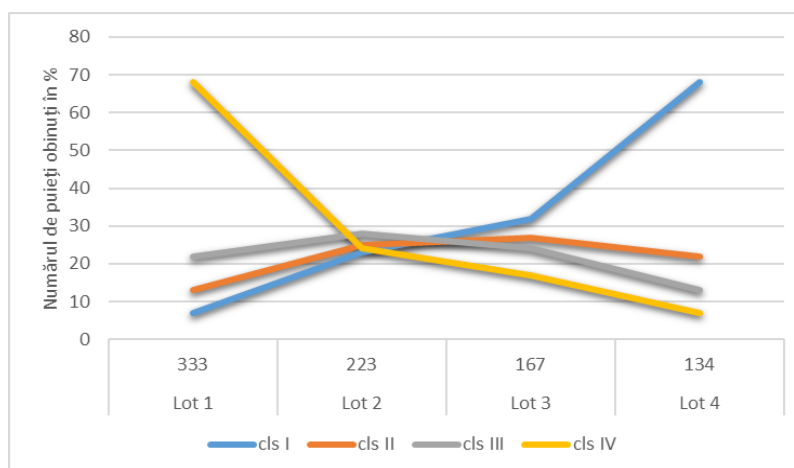


Fig. 2. Distribution on quality classes based on the number of seedlings/surface unit (ha)



Fig. 3. Aspect from the demonstrative lot 2, 15 days after seeding

RESULTS AND DISCUSSION

Acacia breeds naturally both through seeds as well as vegetatively, through root stocks (root suckers). Alongside these two natural means of breeding there are still three artificial methods frequently used, namely: breeding through cuttings, breeding through grafting and micropropagation (breeding through tissue cultures).

As with other forest species (Budeanu et al., 2013), the breeding through seeds in acacia is preferred when it is necessary to produce a large number of acacia seedlings whose obvious phenotype variability does not constitute an impediment.

Certainly, for the four experimental lots from the Bărzani farm where we had the experiment, for determining the number of acacia seedlings in proportion to the surface unit one may affirm that we can obtain a number of:

- up to 333 thousand seedlings/ha in the case of the first lot in which the planting scheme was 20x20x20x20;
- 222 thousand seedlings/ha in the case of the second lot, planting scheme 30x30x30x30;
- 166 thousand seedlings/ha in the case of the third lot, planting scheme 40x40x40x40;
- 133 thousand seedlings/ha in the case of the fourth lot, planting scheme 50x50x50x50.

CONCLUSIONS

Based on the data presented above, one can issue the following preliminary conclusions:

- Based on the seeding scheme we can obtain a number of up to 333 300 seedlings/ha in a production cycle, these were obtained in lot 1, however due to the fact that in this case the plants have a reduced space for nutrition as well as the access of the plants to the light needed for photosynthesis is reduced, it is obvious and demonstrated the result of the experiment through which seedlings in this case, in proportion of 68% are classified under class IV. This class however presents a disadvantage because these seedlings in this case are not fit for planting.
- In order to raise the seedlings' quality class there is also the possibility by means of which the seedlings would undergo two production cycles in the nursery.
- For the second lot taken in the study, one obtained a number of 222 thousand plants/ha, and the quality classes have had an approximately equal share.
- In lot three and four the proportion of the seedlings' quality I and II classes is obvious.

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