

Qualitative and quantitative evaluation of natural regeneration in gaps within beech (*Fagus orientalis* Lipsky) stands of Caspian Region

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Abstract

According to few recent studies, regeneration was favourably established in few natural gaps at beech stands located in Golband Forest of Caspian region of Iran (Jamand district), whereas in other gaps, weeds including *Rubus* sp. and ferns were established. The aim of the research was to investigate the effects of natural parameters, including climate, soil and topography; human and livestock activities and inappropriate gap size caused by removal of trees in the upper storey. For this reason, 13 natural gaps were selected as sampling plots, depending on their regeneration condition and their distribution within the forest. After that, the seedlings age, height and diameter (at collar and breast height) were measured.

The results showed that the seedlings of *F. orientalis* occupied highest area of the gaps (75%) in comparison to other species. There was not significant difference between the beech seedlings in respect to their age (6-8 year old). The gap size had negative effect on seedlings density and positive effect on seedlings height. The branching mode of beech indicates that most of the saplings were forked. Overall, an increase in the gap area, increased the number of the forked and broom shaped saplings. The results showed that cuttings should be made in a way to prevent large gaps. In contrast, the small and medium gaps provide an appropriate area for regeneration, quantitatively and qualitatively.

Keywords: *Fagus orientalis*, gap size, regeneration, beech, sapling.

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Investigation on production of ten most important and well worth native hardwood species at forest nurseries of Caspian region of Iran

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Abstract

Development and rehabilitation are two major factors in the Comprehensive Project of Caspian Forest Conservation of Iran which can be reached by standard seedlings production. Due to importance of these forests, productive afforestation and subsequently seedling production at nurseries in respect to tree species and their quantitative and qualitative characteristics, have a special value in that project. The data related to seedling production at 21 nurseries located at Caspian Region of Iran for five year period (1998- 2001) were recorded and analyzed. The results showed that 57 species were produced in the nurseries, including 31 hardwood and 26 soft wood species and total seedling production was about 30 m/year. From the 31 hardwood species, the proportions of natives and exotics were 95% and 5%, respectively, whereas the proportions for the softwood species were 84% and 16%, respectively. Four of the native hardwood species, including *Acer velutinum*, *Alnus subcordata*, *Fraxinus excelsior* and *Quercus castaneifolia* which have high quality industrial woods, covered more than 50% of the total nurseries seedling production, from which *A. velutinum* and *A. subcordata* covered the highest proportion of these four species. Based on economical evaluation of the species wood values, *A. velutinum* gained the highest value and the other three species achieved the second rank.

Keywords: Caspian Forests, hardwood, softwood, nursery, native, exotic, seedling.

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Investigation on adaptation and performance of Olive (*Olea europaea L.*) cultivars seedlings at Qom area of Iran

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Abstract

The aim of the study was to investigate adaptability of 12 olive cultivars at Maroon station of Qom province of Iran. The trial was conducted under Randomized complete Blocks Design with three replicates. The seedling performances, including height, collar diameter, survival and crown cover diameter were recorded and analyzed for three years. In order to study the resistance of the olives to wind and determine their shade area, other parameters including collar diameter/height and crown cover diameter/height ratios were calculated. The statistical analysis of the third year data showed that the effects of olive cultivars on the whole seedlings performances were significant ($P < 0.01$), whereas the effects of the replicates were not significant ($P < 0.05$). The variance coefficient (cv) of the olive performances was at normal level. The lowest and the greatest values of cv, belonged to crown cover diameter (3-9%) and crown cover/height ratio (12.1%), respectively. The best cultivars in respect to different seedling's performances were as follows:

Height: Rashid and Roughani, collar diameter: zard and valanollia and crown cover diameter: Roughani, Rashid and Zard.

The double statistical analysis for three years, indicated that the effects of year and cultivars on the olives performances were significant ($P < 0.01$), except for collar diameter/height and crown cover diameter/height ratios. Furthermore, the effects of interaction between year and cultivars on the performances were significant (mostly $p < 0.01$), except for collar diameter/height ratio. The four parameters (survival, height, collar and crown diameter) were correlated significantly and positively with each other. According to cluster analysis results, the olive cultivars were classified to four groups: 1- Sivillana, Manzanilla, Zarde-Qom and Shengeh; 2- Arbikin, Gorgan and Mishen; 3- Roughani, valanollia and Rashid' 4- Zarde-Manjil. There were two top growth periods at each year: 16th March to 21st June and 6th September to 21st November.

Keywords: *Olea europaea*, adaptation, height, diameter, survival, crown cover

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Growth and performance of bare and pot rooted seedlings of Loblolly pine (*Pinus taeda* L.) after plantation

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Abstract

Seedling production of *P. taeda* in plastic bags is economically more expensive than bare-rooted method due to limited space for root development (root rotation) and its negative effects on subsequent seedlings growth and performance at field. The aim of the study was to estimate the mortality of the bare-rooted seedlings, particularly after planting at field. The hypothesis was that if the seedling production, transportation and plantation perform in adequate method and time, there will not be significant differences between the bare and the pot rooted seedlings survival and growth. The trial consisted of two stands of *P. taeda* seedlings (each containing 60 seedlings) with 2×2 m Spacing. The bare and pot rooted seedlings were planted at each stand, separately. The growth and survival parameters were measured annually up to three years at end of growth period. The results showed that although height growth of the pot rooted seedlings was significantly more than the bare-rooted seedlings up to two years after plantation, but there was not significant difference at third year. The collar and breast height diameter of the pot-rooted seedlings was significantly more than the bare-rooted seedlings, where as the quality of the bare-rooted seedlings was significantly better than the pot-rooted seedlings. Moreover, survival of the bare-rooted seedlings (75%) was slightly less than the pot-rooted seedlings (88%).

Keywords: Loblolly pine, *Pinus taeda*, height, diameter, survival.

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Investigation on some quantitative and qualitative characteristics of different types of *Pistachia atlantica* at Yazd province

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Abstract

The highest and lowest ratio of the forest cover area belonged to *Pistachia atlantica*, *Acer monspessulanum* (22.5%) and *Pistachia atlantica* – *Pteropyrum aucheri* types (2.5%), respectively. Environmental data including geology, pedology, geomorphology and climatology were collected and interpreted, using map of the forest types distribution. The quantitative and the qualitative data of the forest types were collected, using sampling plots at field works. These data contained crown cover diameter and percentage, height, accompanied plants, breast height diameter, density per hectare, crown phenotype form and health, and trunk individual's gender. The results showed that the most forest types were degraded and thin. The highest and the lowest number of *P. atlantica* belonged to *P. atlantica* – *A. lycioides* and *Zygophyllum aurypterum*-*P. atlantica* types, respectively. The total number of the accompanied species was 62, from which 16 species were trees and shrubs and the rest were herbs and bushes. Overall, 16 pest and one disease species were distinguished on *Pistachia* trees. Regeneration was little in most of the *Pistachia* forest types, but it was best at *P. atlantica*, *A. monspessulanum* type. The *pistachia* male and female trees covered 42.3 and 55.4% of the total trees, respectively.

Keywords: quantity, quality, ecology, pest, disease, regeneration, gender.

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Volume quantity and percentage of Beech industrial, fuel and stump timber portions at Caspian Forests of Iran

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Abstract

The aim of the study was to investigate the volume and amount of the Beech (*Fagus orientalis*) industrial, Fuel and stump timber portions at west forests of Gilan province in Caspian Region of Iran. For this reason 40 trees from three parcels of Nav-Asalem Series were selected randomly. The measured tree parameters were height (total and stump portion) and diameter (at two meter height intervals, breast height, collar and stump cutting surface area). The industrial, fuel and stump timber volumes were calculated, using the formulas of Smalian, Huber and cylinder, respectively. Subsequently, the total volume was calculated from these volumes. Based on the scattered points of total volume and breast height diameter (DBH), the best fitted model was quadratic with correlation coefficient of 0.97. There were significant correlations between DBH and different timber volumes, but the highest ($R=0.97$) and the lowest ($R=0.66$) correlation was between industrial and fuel wood volumes and DBH, respectively. Although there was positive correlation between DBH and industrial and stump timber volumes, but the correlation was negative for fuel wood volume and DBH. The average volume percentage for industrial, fuel and stump woods was 84.35, 12.13 and 3.52, respectively.

Keywords: Beech, diameter, fuel wood, height, industrial, stump, volume

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