Effect of salinity on growth of two wild almond species and two genotypes of the cultivated almond species (*P. dulcis*)

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Abstract

Effect of five levels of salinity on four almond species and genotypes through Factorial Statistical Design, with the basic Randomized Complete Blocks Design, was investigated. The salinity treatments were made, using equal amounts of sodium chloride and calcium chloride at each level. The salinity levels were:
Zero, 500, 1200, 2000 and 3000 mg/L.

The second treatments were:
Amygdalus scoparia, *Amygdalus lycioides* and genotypes 1 and 2 of *Prunus dulcis.*

Washed sand was used for seedbed. The salinity treatments were applied when the almond seedlings reached 15-cm height. The seedlings performance, survival, height, diameter, leaf number, leaf thickness and dry weight (branch, stem leaf and root, separately) were measured and estimated every 15 days.

Increasing salinity decreased the seedling height, diameter and dry weight (leaf, stem and root), significantly. The effect of salinity on the seedlings started with leaf marginal burn then extended to the whole leaf and ended in entire leaf wilting and fall.

Salt level beyond 1200 mg/L at the first period of almond growth, decreased its growth dramatically, damaged the seedlings and finally killed the genotypes totally. The cultivated almonds had greater growth than the wild species at the low levels of salt whereas *A. lycioides* had the greatest growth at the level of 1200 mg/L.

Keywords: salinity, almond, growth, sodium chloride, calcium chloride.

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Investigation on the suitable spacing and combination of ash *(Fraxinus excelsior*L.*)* and maple *(Acer velutinum* Boiss) in plantations.

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Abstract

In order to determine the most suitable mixture and spacing of maple and ash, three levels of planting space including 1.5×1.5, 2×2 and 2.5×2.5 meters and five levels of species mixture including:

100% maple, 100% ash, 65% maple + 35% ash, 50% maple + 50% ash and 35% maple + 65% ash were applied. The statistical design was split Plots in Randomized Complete Blocks with three replicates.

The site was allocated on north slope of Sari Forests at Mazandaran province with altitude about 400 m. above sea level. After termination of the first five year period of the trial, the results showed that:

The effect of the combination and spacing treatments on saplings collar diameter and height was not significant, whereas their effect on saplings survival was significant. Although the effect of spacing on saplings quality was not significant, but the effect of combination was significant. The treatments interaction effect on the whole saplings. The quantitative and qualititative growth parameters was not significant.

The greatest percentage of survival belonged to spacing of 2.5 * 2.5 meters (82%) and ash monoculture (98%). There was not significant difference between the other spacing and combination treatments. The highest and the lowest qualititative values belonged to ash and maple monoculture.

KeyWords: *Acer velutinum, Fraxinus excelsior*, Spacement,Combination, Planting

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Genetic diversity and differentiation of beech forests in Iran

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Abstract

Fagus is one of the most abundant and economically important genera of woody plants in north of Iran.

Genetic variation of *Fagus orientalis* Lipsky was investigated on 14 Iranian beech populations originating from the major part of distribution range of this tree species in Hyrcanian zone.

Genetic diversity and differentiation of beech populations were studied using 16 isozyme Loci at 10 enzyme systems including: PX, LAP, GOT, MNR, IDH, MDH, PGI, PGM, SKDH and 6PGD, by starch gel electrophoresis. A considerable genetic multiplicity (observed number of alleles: 55, mean number of alleles per locus: 3.3 and percentage of polymorphic loci: 100) and diversity (effective number of alleles: 1.288 and expected heterozygosity: 0.191) were found. Overall, 30 rare alleles (less than 5 % of the allelic frequency) were detected. No unequivocal patterns of genetic differentiation could be identified. A slight deficiency of heterozygotes as compared with Hardy-Weinberg expected proportion, was found in the majority of populations.

Key words: *Fagus orientalis* Lipsky, Hyrcanian zone, genetic diversity, differentiation and Isozyme،

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Road Network Planning and selection of Harvesting Machines at"Vaz" experimental Forest.

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Abstract

Regarding to the importance of road network in Forest Management, Woodtransportation and Forest operation, this investigation was carried out in fourdistricts of "Vaz" exprimental Forest. The study area was 4081 hectares.

The forest network planning was based on essential factors such as length of roads, length density of roads, wood transport distance in forest, network percentage, slope, soil mechanics, soil stability, volume of wood production and climatic factors. Three stages were considered to achieve these goals:

In the first stage , existing roads were evaluated and recorded. The results were as follow:

Length of roads: 21770 m, length density of roads: 7.8 m/ha and network percentage: 37

Due to unacceptable of the existing network, in the second stage forest network planning (Major roads and Minor roads) was performed based on the important factors mentioned above to obtain optimal road coverage and to reduce forest damages.

In the third stage, new road network was planned for each district and marked on its natural site, based on the factors mentioned above. The new road network characteristics were as follow :

Length of roads: 52469 m, length density of roads: 12.8 m/ha and percentage of network: 60

The soil mechanics test showed that soil is generally heavy textured with low plastic limit and high liquid limit.

The result showed that although road length density was increased but percentage of road network was not expanded, because steep areas of the forest was a limiting factor for major road network. For this reason, secondary roadnetwork was designed to complete the total road cover.

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As a result, the total length and density of the planned roads were 74459m and 19.5 m/ha, respectively. The density and percentage of minor road network in series 1, 2 and 3 were appropriate and covered a desirable area of the forest.

Slope was an important factor in major and minor road planning. Only 43% ofthe roads were located on the best class of slope (0-30%).The logging roads were located on 62% of the forest ground with moderate mechanical class of soil. Soil stability and climatic factors had important roles in logging road planning.

In district 2, the slope was suitable but the soil stabitlity was a limiting factorin logging road construction all over its area. As a result, cable crane system should be applied to transport logs outside the forest. The soil mechanics test showed that soil is generally heavy textured with low plastic limit and high liquid limit.

Key words: Road network, Road density, Wood transportation, Slope, Soil mechanics and stability

Investigation on growth characteristics of 24 different poplar clones in nursery stage

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Abstract

The first step in planning and implementing any research project isthe possession of preliminary and basic data and information. Growthcharacteristics information of various poplar trees at seedling stage ofnursery, can provide many scientific and basic data for poplarresearchers to implement different projects and apply appropriate ofexprimental nurseries.

In this study the growth characteristics of 24 different poplar clones (one year old seedlings) during the growth season in 1998 at Karadj Alborz Research Center, was studied. Factors such as collar diameter,height, biomass production, leaf characteristics (surface, fresh weight, dry weight, thickness, thoughness and decomposition rate) for all clones were measured. Over all 12 different variables were measured. Another eight variables were derived from the 12 variables. The data andinformation of the 20 variables were analysed, by using the PCAstatistical analysis method and Minitab 8/2 software to ordinate the poplar clones with similar function. The 20 measured variables were ordinated again to identify variables which have effective role in poplarclone grouping.

Based on the 20 measured variables,the results showed that, the clones of *Populus* x *euramericana* had the highest similarity, whereas the clones of *Populus deltoides* were divided to two groups and the clones of *P.alba* and *P.nigra* did not have significant difference. Among the 20 variables which were studied in the nursery, only 9 variables influencedthe clone grouping. Therefore by applying less numbers of variables which they are comfortable to use, we will be able to classify similar clones.

Although there were enough soil moisture, appropriate airtemperature and green and fresh performance of the clones, the diameter and height growth of some clones such as *P.deltoides*72/51and *P.candicans* terminated or decreased significantly at late August whereas some of clones such as *P.e.triplo, P.d.* 69/55*, P.d.*77/51*, P.d.*73/51 and *P.n.betulifolia* continued growing until late October. this was one of the reasons of the highest growth of these clones amongst the other clones in the nursery.

Key words: Poplar, Ordination, Nursery, Clone.

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