

Introduction of some of the ecological and silvicultural Characteristics of the forest areas of Kermanshah province

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Abstract

Climate, plant and soil diversity during ecological development, resulted in complex ecosystems at Zagros zone of Iran. Different forest types diversity from north to south of Zagros, is a good evidence for that case. The importance and the critical role of this ecosystem on economical, social and environmental prospectives of the country, makes it essential to study and investigate the zone comprehensively. However, investigation on relationship between plant cover and the ecological factors which affect the zone, can lead to a better knowledge of the zone.

In vestigation on tree, shrub and grass species autecology at these forest is highly important in order to identify forest distribution of the province according to climate diversity, the climate map (according to the important climate method of de Martonne) was matched with the topographical map of Iran, then controlled by forest walking. The tree, shrub and herb species characteristics and some of the edaphic and topographical parameters were studied using 126 macro plots (500 m²) and 630 micro plots (105 m²), the sampling plots were located on contour lines at 100 m. altitude intervals.

Overall, 13 forest sites at six climate types were identified, based on the applied research parameters, dominant slope direction and 1000 m. distance between the sample plots at each contour line, including: Bayangan & Gahvareh with cold humid climate, Islam – Abade – garb, Darbadam and Geomarg with semi – humid cold climate Tazehbad with very humid cold climate, Ghalajeh with semi humid ultra cold climate, Javanrood with 2 climate types; humid temperate and humid cold and finally five sites: Chaharzbar, Harrasam, Sarv -e- no, Sarpole - e - zahab and Qeymas with semi dry cold climate. Moreovoer, it was identified that: The greatest and the lowest density of the tree and shrub species belonged to Harrasam (semi –

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arid cold climate) and Galajeh (semi – humid ultra – cold climate), respectively.

The highest and the lowest density of the seed origin forests, belonged to Tazeabad (very humid cold climate) and Sarv-e – no (semi – arid cold climate), respectively.

The greatest and the lowest percentage of forest crown cover belonged to humid cold and humid temperate climates of Javanroud, respectively.

Key words: Ecosystem, Zagros forests, Kermanshah, silviculture, Ecology.

Height growth behavior of Poplar clones in Kurdistan

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Abstract

In this study, saplings of eight poplar clones from six species including (*Populus trichocarpa*, *P. nigra* cv. *Kamyaran*, *P.n.56.72*, *P.deltoides 63.3*, *P.euramericana 488*, *P. alba* cv. *Kabudeh Bumi*, *P. a* cv. *Kabudeh Shirazi* and *P. euphratica*) have been evaluated for height growth in Zalleh station of Sanandaj in Kurdistan province. Based on nested design with eight treatments and 10 replicates, the study was carried out in 2001.

The results showed that there was significant difference between the species height performance *P.d.63.3* (234.4 cm) and *P.euphratica* (78.8 cm) greatest had the and the lowest height growth, respectively.

Based on the results, there were three different growing season stages for height growths in poplars, including: 1-primary slow growth stage prior June, 2-fast growth stage during June - September and 3-secondry slow growth stage after September. The daily height growth rate of the poplar clones in mentioned stages were 25.77, 101.57 and 14.52 cm, respectively. *P.d.63.3* as a superior clone among the other clones, had low growth at the first and the third stages but very high growth at the second stage. *P. Trichocarpa* finished the third second stage earlier than the others at July and *P.e.488* showed high growth at the first and stages, but low growth at the second stage.

Considering climate condition of Sanandaj in 2001, the studied Poplar clones began the first stage at average daily temperature of 13°C and average photo radiation period of hour per month (h/m), as well as the second stage at 25 °C and 370 h/m and the third stage at 10 °C and 220 h/m.

Key words: Poplar, *Populus*, clone, Height growth, climate, radiation

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Effect of environmental conditions on survival of *Capparis decidua* seedlings

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Abstract

Ripe fruits of *Capparis decidua* (Forssk.) Edgew. were collected from the species natural habitat in Sirik at Hormozgan Province (June, 2001).

After rubbing and washing the seeds, they were sowed in a nursery in order to test the seeds germination and the seedlings survival. The statistical method was factorial with completely randomized design, consisting of two factors. The first factor was seed treatments which consisted of four levels (12 hours soaking in concentrated sulphuric acid, 45 minutes soaking in concentrated sulphuric acid and full fruit sowing). The second factor was soil mix treatments which consisted of 12 levels (sand, garden soil, clay manure and natural habitat soil). Moreover, correlation between climate parameters (temperature, relative humidity % and monthly evaporation) and edaphic parameters (organic matter %, sand % silt % and clay %) on one hand seedlings survival % on another hand were studied. The results showed that the effects of seed and soil mix treatments on seedling survival were significant ($p < 0.01$) and the best seed treatment was soaking seeds in water for 12 hours which resulted in 59.4 % seedling survival. The best soil mix treatments were number 9 (2.3% of sand + 1.3% of garden soil) and number 1 (1.2% of sand + 1.2% of garden soil) which resulted in 55.8% and 51.3% seedling survival, respectively. The effects interactions between the seed and soil mix treatment were not significant the correlation between air temperature, sand % and seedlings survival was positively significant, whereas the correlation between silt %, clay and seedlings survival % was negatively significant ($p < 0.01$).

Key words: *Capparis decidua* (Forssk.) Edgew., seed treatment, soil composition, germination, vitality.

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**Site demands of False walnut (*Pterocarya fraxinifolia* (Lam.)
Spach) in «Vaz» Experimental Forest of
Mazandaran province**

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Abstract

«Vaz» research forest, one of the most important sites of False walnut in Noor Township and Chamestan District was selected for the study. The distribution areas of False walnut at Vaz forests were marked on a topographical map. False walnut grows usually with other species such as Alder, Persimmon, Caspian poplar, iron wood, maple and hornbeam. with regards to False walnut site condition and its distribution in special parts of the forests, selection of sample plots was not done randomly, but was made manually through recognition of areas, where the False walnut was dominant. The quantitative and qualitative characteristics of the individual trees were measured and recorded within the sample plots with an area of 1000 m².

The results show that False walnut grows often on clay – deep soils, northern slopes of 5 – 10% gradient, altitudes of 500 – 1000 m.a.s.l. and river banks and valley sides with low gradient slope. Vaz forest contains the upper distribution limit of this species in the Caspian region, where it appears up to 1330 m.a.s.l.

Mean stock volume of the studied stands was 415 silve per ha, which 55.6 and 22.9% of it belong to False walnut and Alder species, respectively. In view points of species composition, the False walnut, Persimmon and Alder contributions were 56.4, 14.5 and 8.0%, respectively. The average annual diameter and height growth rate differed at different age stages. For instance, the maximum height growth was at age of 20 year and over 55 year. The False walnut density was 142 stem number per ha, which increased up to diameter class of 35 cm and then decreased over this class. More than 80% of the False walnut trees contain diameter of 10 to 45 cm. Despite of the high density of False walnut seedlings, regeneration was not

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satisfactory and was generally asexual (root sucker).

False walnut trees grow as over as over storey form in most of its sites of the Caspian Forests with *Alnus subcordata* C.A.M., *Alnus glutinosa* Gaetn, *Acer velutinum* Boiss, *Carpinus betulus* L., *Populus Caspica* Bornm., *Fraxinus excelsior* L. and *Juglans regia* L., but in the investigated sites grow as two storey form. The False walnut qualitative characteristics (stem straightness, natural pruning and crown symmetry) were not desirable. Sixteen percent of the studied trees were attacked by pests and diseases, decayed or had crown breakage.

Key words: False walnut, site demand, diameter, height, growth, regeneration, Caspian forest.

Effects of spacing treatments on production of Poplar and alfalfa in intercropping method

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Abstract

Poplar species are usually cultivated for their wood production in most areas of Iran. They are traditionally planted with low spacing which does not render thick trees.

Moreover, for different reasons, increasing poplar spacing is not accepted by people and the farmers before accepting a new system, pay high importance for earning continuous income. Thus, additional income besides wood products is a vital factor to increase the public acceptance for poplar intercropping system. Therefore, intercropping poplar and fodder with increased spacing in order to increase under Randomized Complete Block Design in 1998 with three replicates, using seedlings of *P. nigra* betulifolia, four spacing treatments (3×4, 3×6.66, 3×8 and 3×10m.), intercropped alfalfa and two monocultured control treatments of poplar and alfalfa.

The trial continued to 2003. Each plot area was 1200 m². Ten different growth parameters the poplar and alfalfa species were measured. The data were analyzed, using the univariate and the multivariate statistical methods.

The results showed that the effect of treatments on poplar and alfalfa parameters were the greatest poplar height and volume amounts belonged to the spacing treatments of 3×4, 3×8 and 3×6.66m which were 1541, 141, 136 cm and 31.7, 20 and 19m³, respectively. The greatest production of alfalfa belonged to control, 3×10 and 3×8 m. spacing treatments which were 7507, 4788 and 4265 Kgha-1 biomass dry weight. The effects of the treatments on branch diameter and annual stem diameter growth rate were not significant, whereas the effects of time and interaction between time and treatments on some growth parameters were significant.

Key words: Agro forestry, Intercropping, Poplar, Alfalfa

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Primary Research on establishment of olive seedlings at rainfed condition

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Abstract

The aim of the study was to examine the effect of one-year old olive seedlings (*O. europaea* L.) grown in pots under compacted soil and water deficiency conditions, on its subsequent survival and growth at field and rainfed circumstances. Compacted soil usually restricts seedlings root development, particularly in pots. The hypothesis was that the restricted and stressed roots might penetrate the soil layers deeply and widely after plantation at field condition. This means more availability of water and nutrition to olive seedlings and successful plantation at rainfed circumstances. The trial was conducted at two stages, including *invivo* and *in situ* in the Iranian National Botanical Garden at Tehran in 2002. Overall, 36 polyethylene sewerage pipes were used as pots (65 and 10 cm height and diameter, respectively) in the *in vivo* stage. The stress treatments were two levels of soil compaction (bulk densities of 1.3 [low] and 1.6 [high] g/cm³) and two irrigation period intervals (three [wet] and six [dry] days). The pots were grouped to two level sections and each section was filled with one of the levels of the compacted soil (sandy clay loam) up to 50 cm height. The seed propagated seedlings were transferred into the 36 pots and the two irrigation treatments were applied to the pots at each compaction level, separately under glasshouse condition.

Before transplanting the seedlings into the designed site in March 2003, the soil was tilled deeply at two directions by tractor. The planting holes were dug at 3 by 3 m. spacing system, using a tractor drill. The site soil type was sandy with more than 50% gravel content. The experimental design was Factorial under completely randomized blocks with two factors (compaction and irrigation preplanting treatments), two levels and three replicates. There were three seedlings in each plot. The effects of the treatments on seven shoot and root parameters were measured. The seedlings were harvested on January 2004. Except after transplanting, the seedlings have not been irrigated during the trial.

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The results show that the seedlings survived successfully (100%) during the growth period, particularly under high drought stress, but without significant differences between the preplanting treatments. Irrigation and compaction did not have significant effects on shoot and root growth parameters, whereas their interactions had significant effects ($p < 0.05$) on only four seedling growth parameters, including shoot height and dry weight, leaf dry weight and root/shoot ratio. The greatest mean of shoot height and leaf dry weight belonged to seedlings pretreated with high levels of compaction and water stress. The highest mean of shoot dry weight achieved in seedlings pretreated with high level of water stress and low level of compaction or high level of compaction and low level of water stress (20.7 and 19.76 g, respectively). The greatest mean of root/shoot ratio belonged to seedlings pretreated with high level of water stress and soil compaction (0.84).

It could be concluded that although both the compaction and drought preplanting stresses did not significantly influence survival, but they significantly affected shoot and root growth parameters. Therefore, the results can be applied for most of the semi-arid zones, using preplanting deep tillage method at two directions and after planting mulch cover for soil surface.

Key words: compaction, drought stress, *Olea europaea*, rainfed, root, soil.

The study of wild *Pistacia* distribution in Markazi Province

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Abstract

Considering appropriate adaptability of different wild species of *Pistacia* in different Arid and Semi-Arid environment of the country as well as its high value from the point of view of Resin and other chemical production, oil, and pharmacological consumption of their seeds, founding their habitats in the different areas of Markazi Province seems to be important. In this project first of all, the basic information including topographical, soil, climate, geological, and land use map of the area with 1/50000 scale were prepared and digitized. Then all the areas which have covered by wild *Pistacia* were visited and recorded by GPS and then digitized. In order to study the quantity and quality characteristics of the species, some sample were taken from 1600m² in some distributed areas of wild *Pistacia* according to different climatic condition of the Province. The parameters, such as the number of trees in the samples, trees height, trees width, trees diameter in height breast, the crown height and diameter, growth type and,etc were recorded in sampling areas. After establishing the DEM of the areas, aspect and slope map were also produced using ddx and ddy filter in ilwis academic program Package.

On the basis of this investigation the following results were obtained.

20 polygons of wild species of wild *Pistacia* with total areas of 2216 ha were recognized in Makazi Province of Iran.

The species-environment relationship including: slop, aspect, climate, landuse and soil were determined using maps integrating and data overlying.

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