Agricultural Journal 6 (4): 194-196, 2011
ISSN: 1816-9155

An Investigation Growth Rate on Needle Leaves Species in Namin Forest (Case Study: Shoghaleh Daragh Region)

Ali Teymorzadeh, Younes Rostamikia, Ebrahim Fataei, Habib Farhadi and Ayat Mohammadpour
Islamic Azad University, Ardabil Branch, Ardabil, I.R. Iran

Abstract: Compatibility of industrial species with low demands, especially needle leaves is essential in afforestation and reforestation development. In order to viability and growth rate study of three planted coniferous species were assessed during the year 1998 in Namin forest, Shoghaleh-Daragh region of include country name here with area 50 ha were selected. These species were *Picea abies* (L.) H. karst, *Pinus nigra* var. *carmanica* J.F. and *Cedrus libani* to achive this, a random systematic sampling network of 100×100 m dimentions including 50 sampling plots (10×10 m) with square shape were employed. In each plots, quantity of species occurrence and morphological were assessed such as height, collar diameter, crown diameter and quality characters of viability rate and crown symmetry.

Key words: Quality and quantity, survey, viability, needle leaves vigor, Namin forests, Iran

INTRODUCTION

The Islamic Republic of Iran (I.R. Iran) with area of about 1,648,000 km^2 is located in the Southwest of Asia and lies approximatery between 25' and 40'N in latitude and between 44' and 64'E in longitude. The countries total forest area is 12,400,000 ha, it occupies with land area only with only 7.5% (Marvie-Mohadjer, 2005). Ardabil province located in Northwest of Iran with 63,000 ha Southern hillside of Alborz mountain. Compatibility of industrial species with low demands, especially needle leaves is essential in afforestation and reforestation development (Bahri, 1993). Needle leaves have especial important because of low demands, growth rate, there are also of great economic value, primarily for timber and paper production (Fattahi, 1994). This quantitative research and investigation was to assessment of presence condition of afforestation management strategies followed in Namin forests in Ardabil province of Iran.

Assessment of needle leaves has long record in Iran, the 1st survey was carried out by forests and rangland research institute for determination compatibility and comparision of species in different ecological condition from 1969. On the bais of this report, investigation of suitability on Pinus teda and other species in research station of Pilambara, Astara, Seravan of Rhasht forest showed that planting successful. This species considerable pay attention to viability, settlement and growth as an exotic pine (Fattahi, 1994). An investigation growth rate of *picea abies* (L) H. krast in Guilan afforstations was showed that basal area, total volume and annual volume growth were measured with 37 m^2, 301.25 and 11.1 m^3 ha^{-1}, respectively (Siahipour *et al*., 2001). Due to viability and growth assessment of two planted coniferous species in 1996 located in Arasbaran forests, Heresar and Kalaleh regions were studied. These species are including *Pinus pinea*, *Cupressus sempervirens* var. *horisontalis*, *Pinus nigra austrialia*, *Pinus eldarica*, *Cedrus atlantica*, *Cupressus arizonica*, *Pinus sylvestris*, *Picea abies*, *Pinus pallasiana*, *Pinus carmanica*, *Pinus brutia* and *Larix decidua*. Totally, the mean of viability percent, collar diameter and height were 88.88, 13.56 and 5.44%, respectively. *Pinus eldarica*, *Cupressus arizonica*, *Pinus pallasiana* and *Pinus brutia* had the most viability among whole of species (Gharachorlou *et al*., 2010).

In midland regions of Nave-Asalem, *Picea abies* species were considered as the best successful among fifteen species and different provenances. The upland of same region, *Larix leptodepsis* was the most adapted species among different nine species and provenance (Hematti and Afraz, 1998). Investigation of needle leaves different species in Mediterranean and Ejeh sea shores showed that *Pinus brutia* has appropriate growth rate in Mediterranean regions. In Southern beaches of Ejeh sea, *Pinus brutia* and in Northern beach, *Pinus amblifera* were successful of other species (Simsek, 1985). In order to investigate on the adaption and performance of exotic trees in Northern of Iran, a fild exprement coniferous was carried out 1991-2006 in Asalem forest. There parameters of survival, diameter and height were measured. The results showed that the was a significant difference of

Corresponding Author: Younes Rostamikia, Islamic Azad University, Ardabil Branch, Ardabil, I.R. Iran

growth factors (diameter and height). *Pseudotsuga menziesii* (prov. California) showed that hightest height (10.2 m) and *Pinus nigra* var. *calabrica*, the hightest diameter (16.1 cm) after years of study period (Hematti *et al*., 2009).

MATERIAL AND METHODS

Site study: Due to assessment of viability and growth of needle leaves different species, three coniferous species of *Pinus nigra* and *Picea abies* and *Cedrus libani* planted in the year during 1998 located in the Shoghaleh-Dragh region with 50 ha was selected. This site is located 5 km Namin city and adjacent Ardabil-Astara road in Ardabil province with 38°26'55" Northern latitude and 47°36'18" East longitude located in from 1540-1644 m.a.s.l.

The study area experience with annual precipitation 338.9 mm. The annual temperature average duration, the coldest is 3.6°C and during hottest month is 15.5°C. Relative air humidity range from 51.4% in summer and 83.1% in winter. Average relative air humidity is 67.3% in study area. According to Dombarton approach, the climate is cold mid arid (I = 16.7). The soil texture is Clay-loam and the depth is >70 cm. The bedrock is typically conglomerate and limestone.

Sampling and variable measurement: At 1st network of sampling, 100×100 m dimensions was determined to assess the species growth rate and viability rate employed with Random-systematic sampling method, 50 sampling plots (10×10) with square shape were selected. In each plot, different features were recorded including altitude, direction of slopes, collar diameter, total height, trunk length, quality character including viability percent and crown symmetry.

Data analysis: After inventory and collecting of nessessery information, the data were entered in Excel and Spss 16.0 statistical programs. Height, diameter curve statistical parameters (mean, standard deviation) used for each species. Duncan's test was used for compare means of statistical tests.

RESULTS AND DISCUSSION

Total height: From the analysis point of view, *Picea abies* species had height with 4.25 m and *Pinus nigra* had the least mean height with 20.85 cm. The results of F-test showed that there were no significant difference factors (total height, collar diameter and crown diameter) among spccies (Table 1 and Fig. 1).

Collar diameter: *Picea abies* had the most meam of collar diameter with 24.25 cm and *Cedrus libani* had the least mean of collar diameter with 20.85 cm. The results of F-test showed that there was not significant difference of collar diameter factor among species (Table 1 and Fig. 2).

Crown diameter: *Picea abies* had the most mean of height with 2.85 m and *Pinus nigra* had the least mean of height with 2.40 cm. The results of F-test showed that there was not significant difference of crown diameter factor among species (Table 1).

Viability: *Picea abies* had the most mean viabilty with 60.20% and *Cedrus libani* had the least mean of viability with 35.37%. The results of F-test showed that there was significant difference of viability factor among species (Table 2).

Crown symmetry: *Picea abies* had the most mean crown symmetry with 96.34% and *Cedrus libani* had the least mean of crown symmetry with 72.20%. The results of F-test showed that there was significant difference of viability factor among species (Table 2).

Based on the assessment of quantitative study using the statistical tool analysis of variance on baiss of quantity factors including (height, collar diameter and crown diameter) for studies species showed that mentioned characters no significant difference among species but the greatest mean of height belong to *Picea abies* whereas studies of Hematti *et al*. (2009) showed that there was a significant difference of growth factors (diameter and height) after 16 years of study period. Growth rate of *Picea abies* species in studied region is more than in comprising with Arasbaran region. The resean of more growth rate, this species can be related to its need to high moisture. Viability percent is one of the

Table 1: Analysis of variance on bais of quantity characters

	F-test		
Species	Total height (m)	Collar diameter (cm)	Crown diameter (m)
Picea abies	4.25^{NS}	24.25^{NS}	2.85^{NS}
Pinus nigra	3.21^{NS}	23.52^{NS}	2.40^{NS}
Cedrus libani	3.85^{NS}	20.85^{NS}	2.55^{NS}

NS = Not Significant

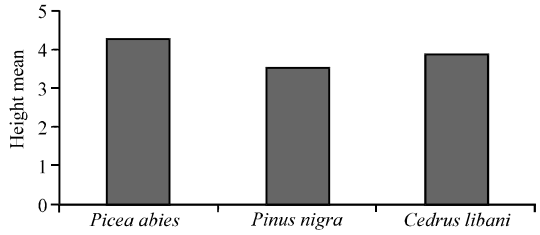

Fig. 1: Height mean for studied species

Table 2: Viability percent and crown symmetry of species on bais duncan test

Species	Viability (%)	Crown symmetry (%)
Picea abies	60.20[a]	96.34[a]
Pinus nigra	44.52[ab]	84.32[ab]
Cedrus libani	35.37[c]	72.20[a]

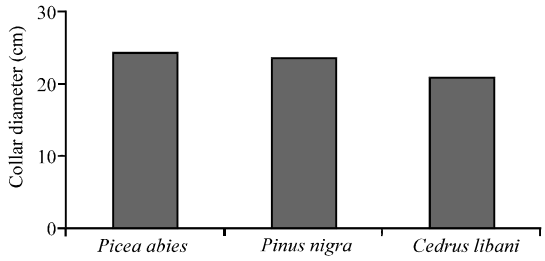

Fig. 2: Collar diameter mean for studied species

most important factor in assessment projects related to exotic species. Bahri (1993) showed that *Picea abies* species is adapted to Farim region condition of Mazandaran province(North of Iran) with 95% viability. In study region, *Picea abies* had the most meam viability percent and *Cedrus libani* had the least mean of viability. Siahipour *et al*. (2001) showed that *Picea abies* had the greatest survival (70%) in Guilan afforestation (North of Iran). Annual Growth rate of height for *Pinus nigra* in study region was 0.27 m. Fattahi (1994) studied the compatibility of exotic needle leaves species in Kurdistan (West of Iran). The resulte showed that *Pinus nigra* had height in increment mean of 0.11 m.

CONCLUSION

The results showed that analysis of in species height, collar diameter and crown diameter was not significant difference among species. *Picea abies* (L.) H. karst had mean height measuring with 4.25 m and *Pinus nigra* had the least mean of height measuring with 20.85 cm. From viability point of view, *Picea abies* (L.) H. karst had the most viability rate in the study area.

REFERENCES

Bahri, Y.G., 1993. Studing Pinus teda increment in Guilan. Pajohesh Va Sazandegi J., 6: 34-37.

Fattahi, M., 1994. Studing agreeable exotic coniferous in Kurdistan. Forests and Rangelands Research Institue, No. 109, (In Persian).

Gharachorlou, A., H. Kiadaliri, E. Adeli and A. Alijanpoor, 2010. Studing quality and quantity of coniferous species in Arasbaran forests (Case study: Heresar and Kalaleh Region). World Applied Sci. J., 8: 334-338.

Hematti, A. and G.H. Afraz, 1998. An introductory report on adaption research design concerning the world coniferous trees in the region Asalem forests. The Research Center Resources and Husbandry of Guilan Province, (In Persian).

Hematti, A., B.K. Shiraz and B.G. Vangah, 2009. Elimination trial on some of important conifers in Asalem forests. Iranian J. Forest Poplar Res., 17: 64-72.

Marvie-Mohadjer, M.R., 2005. Silviculture. 1st Edn., Tehran University Press, Tehran, Iran, ISBN: 964-03-5098-2 (In Persian).

Siahipour, Z., T. Rostami, K.H. Sagheb-Talebi and K. Taheri, 2001. An investigation growth rate on *Picea abies* in Guilan afforestation. Iranian J. Forest Poplar Res., 10: 1-53.

Simsek, Y., 1985. Studing on the Growth of Forest Growing Exotic Species Introduced to Turkey. Forest Research Institute Publication, Bahcelievler, Ankara, pp: 24.