Biological Forum – An International Journal **7**(1): 1716-1718(2015)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

The Diameter and Height of Pine Trees Tehran in relation to changes in Environmental factors

Abdolhossein Nahvi*, Behrouz Kord** and Sara Pourabbasi**
**Department of Forestry, Collage of Natural Resources, Lahijan Branch, Islamic Azad University, Lahijan, Iran*
***Department of Green Space Engineering, Malayer Branch, Islamic Azad University, Malayer, Iran.*

(Corresponding author: Behroz Kord)
(Received 27 April, 2015, Accepted 07 June, 2015)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: This study aimed to investigate the response of pine trees Tehran to change some features of slope and aspect were in Forest Park. For this purpose 70 circular plots 200 m^2, in four aspects and three classes slope, 0-15, 16-30, and 31-45 percent respectively. In each sample plot, DBH and height of trees was measured. Results showed that the slope and aspect been effective on DBH and height of pine trees while their combined effect are significant only on the height of the trees. Maximum height and diameter of pine trees in the south and east sides and steep 0- 15 percent. In order to increase the size of small features, planting this species in the same ecological areas in the east and south and the relatively gentle slopes is recommended.

Keywords: Afforestation, slope, aspect, DBH, height, forest park

INTRODUCTION

In a country like Iran, which has a dry climate, the development of forests through afforestation is one of the main objectives numerous. Basically afforestation in arid zones for different purposes and sometimes it could be a lie, including issues related to conservation and soil fertility, creation of green areas and construction of resorts around cities, air and stylized wood production year (Boisseau *et al.,* 1996; Randall, 1998). Since using afforestation man seeking a new and relatively stable ecosystem, so is an appropriate species selection, consistent and favorable growth and interest are to be survive (Taheri, 2008). Stated that the soils under pine Tehran, loam percent increase, and these increases soil acidity and phosphorus has pine trees in Tehran in eastern and southern Forest Chitgar Park are the better growth (Taheri, 2008). Pine Tehran stopped introduced to maintain the soil water deficiency and soil saturation Clement (Chandran, 1994)]. Pine trees concluded that the tallest trees in the eastern and southern directions. The diameter pine trees in slope gradient of 5-15% more than 16-40%.Said that factors such as temperature, rainfall and soil are the most important factors influencing the growth of pine trees (Connors, 1997, Fernandez, 1997). Growing conifer trees on steep slopes 5-15% more than 40-16 percent. In its investigation concluded that the slope and driving directions on the growth and survival of species of conifers is. The aim of this study was to evaluate the effect of environmental factors (slope and aspect) on the diameter and height pine trees in the forest park Chitgar.

MATERIAL AND METHOD

An area of 405 hectares of pine forest plantations Tehran, about 105 hectares of surface, including four geographic slope 0-15, 16- 30 and 31-45, respectively, were selected. To study systematic random samples of 150 × 100 m grid were uniformly across the region were selected. Why systematic random sampling, the same habitat and ecological conditions, and also implement the plots in the surface. Due to the size and needs of the grid and using equation 1.

N: Area/plot (1)

Total of 70 samples were selected for sampling operations. Since afforestation in areas such as research parks, trees, pure and homogeneous plots within the group, to be compared with each other, an area plot of 200 square meters (2-R) and in the form of circular was considered

Accordingly, at least 15 bases in each plot to be harvested. Then DBH and height of trees were collected from each sample, and environmental factors such as slope and aspect was studied. Soil studies are based on drilled in the area and assess the results of which were adopted. To do this, proceed to 4 profiles with dimensions of 0.75 × 2 m and the depth in the tree cover was typical.

Statistical analysis was performed using software SPSS. For this purpose, Duncan test and analysis of variance to compare significant way to judge the influence of environmental factors on the level of 95%.

RESULTS

According to measurements taken, DBH pine trees range in the region of 5.1 to 35.3 cm and average is 16.2 cm. Duncan's multiple comparison test results showed that the mean diameter of pine trees in eastern and southern directions, respectively 18.1 and 17.2 cm more than in the western and northern sides by 14.6 and 13.4 cm. The diameter of the trees on the slope of the floor 0 -15 percent (16.8 cm) compared with 16- 30 percent slope classes (14.3 cm) and 31-45 per cent (6.9 cm).

Two-way ANOVA showed that the slope and to have an impact on the variable diameter trees while interaction with variable aspect and slope diameter difference was not significant (Table 2).

Height pine trees in the region of 3.2 to 15.5 meters and an average of 4.7 meters vary skins. Also, the slope of the floor height of pine trees Tehran 15-0 percent (7.6 m) compared with classes slope 16- 30 percent (1.5 m) and 31 to 45 percent (3.8 meters) is the highest value.

The results showed that two-way analysis of variance for the height and slope of pine DBH trees. The combined effects of aspect and slope significantly different skins with variable height (Table 3). In soils covered pine trees Tehran significant changes in soil acidity and electrical conductivity was observed range. The results showed that this increase in available phosphorus and organic carbon and total nitrogen decreased soil (Table 1).

Table 1: Physical and chemical characteristics of the soil in the study area.

Depth (Cm)	Clay%	PH	Organic Carbon	Nitrogen%	C/N	phosphorus mg/kg	K Mg/kg
0-10	10	7.5	1.88	0.2	9.4	14.4	320
11-20	5	7.7	0.89	0.09	9.	9.4	240
21-30	6	7.7	0.64	0.06	10.1	13.6	180
31-40	5	7.8	0.61	0.06	10.4	12.9	240

Table 2: Two-way analysis of variance DBH under the influence of slope and aspect.

	Source changes	Freedom	sum of squares	Mean of suares	F	p
	aspect	3	39.876	13.92	4.021	0.008*
	slope	2	37.534	18.676	5.678	0.004*
	Slope *aspect	6	30.176	6.035	1.826	0.110ns
	Error	231	396.077	1.730		
	Total	258	11577.360			

* Significant 5% ns: not significant

Table 3: Two-way analysis of variance for height under the effect of slope and aspect.

	Source changes	Freedom	sum of squares	Mean of suares	F	p
	aspect	3	3.186	1.59	4.329	0.015*
	slope	2	2.073	0.69	1.878	0.021*
	Slope *aspect	6	2.54	1.274	3.462	0.033*
	Error	231	634.632	3.305		
	Total	258	20359.180			

* Significant 5% ns: not significant

The results of this study showed that the tilt and direction on DBH and height and the interaction of the slope and height of the pine trees in Forest Park Chitgar was significant. Regardless of the slope, to the east and to the north low diameter to have the trees as the tall trees in the east and to the west are the shortest. Maximum height of pine trees in general, in the east and south. It can be concluded from this study that the best trees in the east are a few of the features. Tehran favorable growth pine forest planted in the park in the eastern slopes has reported Lavizan. Favorable growth pine trees in the eastern and southern slopes have reported. In this study, DBH height of pine trees on the slope of 0-15% more than other classes which corresponded to the subject of this investigation. It also changes the electrical conductivity of the soil cover increase Pine Tehran shows that the main reason for the difference is the effect of the coating. That significant amount of calcium and other minerals covered in species of conifers increases the electrical conductivity. In addition, the amount of phosphorus in soils is covered by pine Tehran.

REFERENCES

Boisseau, W. (1996). Kronenbildermit Nadel-und Blattverlust prozenten. Erich Muller, EAFV, 98p.

Chandran, P., Dutta, D.R., Gupta, S.K. and Banerjee, S.K. (1994). Soil characteristics under different forest cover in the eastern Himalayas. *Indian Agriculture,* **31**(2): 93-99.

Connors, M. (1997). Growing Christmas Tree in Texas. Ithaca, Ny: Cornell university, *Cornell Agricultural Experiment Station,* 15p.

Fernandez, R.A. (1997). Effect of deforestation and afforestation with pinus spp. On some soil chemical characteristics. *Ciencia del Suelo,* **5**(2): 123-129.

Randall, W. (1998). The impact of environment and nursery on survival and early growth of Douglas fir, Noble fir and White pine. *Western Journal of Applied Forestry,* **13**(4): 137-143.

Taheri. A. (2008). Evaluation of the Pine and acacia plantations on some physical and chemical properties of soil and vegetation under storey. *Journal of Research and Construction,* **32**: 6-15.