

EFFECT OF IRRIGATION FREQUENCIES AND MULCHING ON THE ESTABLISHMENT OF VARIOUS TREE SPECIES IN CHITRAL-A CASE STUDY AT SYED ABAD

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Abstract

The study was conducted to assess the effects of various irrigation frequencies and mulching treatment on the survival of seven forest tree species namely; *Ailanthus altissima*, *Robinia pseudoacacia*, *Elaeagnus hortensis*, *Cedrus deodara*, *Pinus halepensis*, *Quercus baloot*, and *Eucalyptus camaldulensis*. Treatments of mulching, species and irrigation frequencies indicated significant differences on initial survival of seedlings. Plants showed better survival under mulching and irrigation thrice a month, while *E. camaldulensis* gave the best survival (11%) followed by *A. altissima* (6%) after 4¼ years of planting.

Introduction

Chitral district is situated in the extreme north west of Pakistan. It lies between 35° 12' to 36° 50' N latitude and 71° 2' to 73° 53' E longitude (Ayaz, S.M. 1964). The area of Chitral is very rugged and consists of deep valleys having steep and precipitous slopes, which are susceptible to erosion. The elevation of Chitral mountains ranges from 1084 m to 7579 m where the soils vary from shallow on slopes to stony in the plateau. It is a dry area where climate ranges in the valleys and lower slopes from dry subtropical through semi-arid with temperate to alpine at higher elevations. The area receives mean annual rainfall of 170 mm in the form of scanty showers and some snowfall at the end of October or early November. Frost is very common during winter, while the average monthly temperature ranges from 1°C to 36.7°C. The existing forests are distributed in the south with large areas of oak forests (*Quercus baloot*), while the forests on the dry soil consist of *Pistacia*, wild almond with *Pinus gerardiana*, while *deodar* and *juniper* are found at higher slopes.

The harsh climatic and soil conditions have restricted the natural regeneration of vegetation in the tract, while, the biotic factors have adversely affected the growth of vegetation. It is therefore imperative to identify suitable plant

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species and develop appropriate afforestation techniques for these areas, so that the land degradation process in this area is minimized. For such situations, Sheikh (1987) suggested to adopt proper water harvesting, economic use of water, moisture preservation by mulching, deep planting and species selection as planting techniques. This study was carried out to identify suitable tree species and study the efficacy of various irrigation frequencies and mulching technique for the initial establishment of forest tree species seedlings under very specific site conditions prevailing in Chitral area.

Materials and Methods

The study was carried out at Syedabad, located at 13 km from Chitral city towards Darosh and is almost a plain area. The experiment was laid out by using the Split-split plot design with the following treatments:

Major treatments:

- i. Stone mulch
- ii. Control (No mulch)

Intermediate treatments: Seven tree species, namely;

- i. *Elaeagnus hortensis* (Russian Olive)
- ii. *Robinia pseudoacacia* (Robinia)
- iii. *Ailanthus altissima* (Ailanthus)
- iv. *Quercus baloot* (Oak)
- v. *Pinus halepensis* (Quetta pine)
- vi. *Cedrus deodara* (Deodar)
- vii. *Eucalyptus camaldulensis* (Eucalyptus)

Minor treatments: Control and 3 irrigation frequencies viz;

- To = Control (No irrigation)
T1 = Irrigation* once a month
T2 = Irrigation twice a month
T3 = Irrigation thrice a month

(* One irrigation = 2 litres of water per plant)

The experimental area (approximately 1.0 ha.) was divided into 3 blocks (replications), plots and subplots (treatments) according to experimental design. Pits of 60 cm depth and 45 cm diameter at a spacing of 2 x 2m were dug for planting. Various treatments were allocated to plots and sub-plots through randomization.