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POROMETRIC STUDIES FOR SELECTION OF ARIDITY TOLERANT MULBERRY VARIETIES IN WESTERN RAJASTHAN

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Abstract

Mulberry belongs to the family Moraceae and genus is Horus. Mulberry is a deep rooted perennial plant and leaves with acute margin, toothed, 3-5 lobed. Mulberry is primarily known as food material for silkworm and economic importance. Porometer studies growing were carried out to find out the adaptability of plants in Rajasthan. Relative temperature the experimental field in the semi-arid. The main parameters studied were: zone of leaf temperature, humidity and transpiration. It was observed was maximum (37.62°C) during summer that (noon) leaf and minimum (23.78°C) during winter (morning), relative humidity was maximum (47.26) during summer during rainy (morning) and (noon), and transpiration was minimum (13.88) maximum (10.70) rainy season (morning) and minimum (2.64) during summer (noon). The water relations studies help in identification of most adapted, aridity tolerant mulberry varieties for sericulture development in the semi-arid zone of Rajasthan.

Introduction

One of the most spectacular feature of the desert land scope is the occurrence of poor vegetation cover of is important therefore, to examine the ecology and zoology in terms. of environment and adaptability of plant species found therein. The climate of Indian arid ecosystem is characterized extremes of temperature with very cold winters and very hot summer that desert which marks the eastern extremity of the north tropical desert belt, is characterized by desertic and sub-desertic climate, tropical in character. Desertic conditions are due to the absence of moist monsoon air which is prime contributor of rainfall throughout the country. Evaporation from the land surface and transpiration through plants outstrip the precipitation. To make the matter worse,

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the rainfall is not only scanty but highly variable.In the Indian arid zone, the climate is characterized extremes of temperature with very hot summers. In winter the tempreture falls at many places below freezing point and the frost occurs, while in the summer heat is very intense and scorching.

Mulberry belongs to the family moraceae a deep rooted perennial plant and genus leaves Morus. is margin with acute, toothed and 3-5 lobed. Mulberry is being the only food plant of silkworm, nori, qualitative and quantitative improvements of is the basis for the progress of sericulture industry. Unit area is the Bonbyx mulberry Production of higher and better quality leaf in air of every sericulturist.

Water is one of the most important constituent of the multi factorial environmental which exerts etc factor operative influence on any and every ontogeny phase in the life cycle of a plant. The survival of plant depends largely on their adaptive transformation of physiological processes during the course and the capacity rate of each day and throughout the entire vegetation season. The main difficulty with which plants in desert are confronted is to maintain a favorable balance between absorption and transpiration under the adverse conditions of environment. The demands hot and dry atmosphere of Indian desert demand excessive transpiration, while deficient soil moisture impede absorption.

Another important limiting factor for crop production western Rajasthan is the deficiency of plant nutrients. The most commonly limiting crop growth are in three nutrients Nitrogen, Phosphorus and Potassium. In addition compost and green manure also play an important role in boosting the leaf yield and quality.

The vast experience of the physiological and agronomical changes relating to the adaptive strategies of plants to arid and semi-arid climate will assist and guide to have a better understanding of ecophysiology of mulberry in western Rajasthan.

Material and Methods

Collection of different mulberry varieties from different local farm and planting them in field of new campus, J.N.V. University, has has been taken up. For the quantitative study of mulberry of plants in relation to their accurance at different areas, 3 sites were selected; they are located at Mandore, Chopasni Village and Botanical Garden, J.N.V. University. Survives were made periodically and studied were carried out by porometer study. Different parameter of porometer studies were carried out to mulberry plants.

(a) F = Flow
(b) Cv = Cuvette temperature
(c) Lt = Leaf temperature
(d) RH = Relative humidity
(e) Q = Quantum of light
(f) DR = Diffusive resistance
(g) T = Transpiration

The present studies were carried out the seasonally Dec 2020 to August 2021. The various parameter: flow of dry air, leaf temperature relative humidity, quantum of light received, stomata resistance and transpiration were measured clamping the leaf samples (Dorsol and Ventral Surface of leaf) in the cuvette. The data were recorded after remaining the leaf samples, the stored data were read through selecting display. The observations were recorded during morning, noon and evening times.

Observation:

The porometer transpiration, relativity humidity and leaf temperature studies in conducted at the experimental field : DR was maximum (37.62°c) during summer (noon) and minimum (23.78°C) during winter(morning), RH was maximum (49.26) during rainy(morning) and minimum (13.88) during summer (noon), T was maximum (10.70) during rainy (morning) and minimum (2.64) during summer season (noon).

Discussion:

Life evolved in water, and water remains the essential medium in which biochemical processes take place. Protoplasm displays the signs of life only when provided with water, if the dries out it does not necessary dies, but it must at least enter the state in which the vital processes are suspended. This suspended state is called suspended animation.

Plants growing in water stress/saline soils. are considered from the point of view of form, structure and function as xerophytes. Both xerophytes and halophytes are physiologically and anatomically adapted to inadequate amount of water in soil.

The ecological limit for distribution of plant communities can be chemical, physical or biotic, factors but important only to the chemical factors. In hot desert, like Indian desert arid climate including deficiency of water scorching sunlight, deep ground water table also natural vegetation. During harsh summer seasons in these areas completely dries of develop characters, which help in their survival.

In mulberry plants the transpiration rate is maximum in the rainy season and minimum of the summer - Darwin(1898) observed that dry air closed stomata is independently of water deficits. Convincing evidence that stomata close with a decrease in humidity of the air or an increase in vapor pressure deficit of the ambient atmosphere was provided by Raschke (1970),, Lange et al (1871) annd Schulze et al (1872). Water relation studies are necessary to varieties evaluate for cultivation in the semi arid the soil of suitable Rajasthan. Further studies are in progress to correlate different environmental factors which have a critical role in transpiration and water economy of mulberry varieties in this region.

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