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SHORT COMMUNICATION

Impact of addition of soil amendments and microbial inoculants on nursery growth of *Populus deltoides* and *Toona ciliata*

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Abstract Present study evaluated growth of *Populus deltoides* G48 and *Toona ciliata* over a period of 6 months, in nursery soil amended with 10% fly ash (v/v), 5% distillery waste (v/v), 20% farmyard manure (v/v) and microbial consortium of *Pseudomonas striata* and *Azotobacter* sp. @ 30 ml/pot in different combinations leading to 12 different treatments with 16 replicates in completely randomized block design. Biometric parameters such as plant height, collar diameter and total dry biomass were analyzed which indicated that the treatment (T8) comprising of fly ash @ 10% (v/v), farmyard manure @ 20% (v/v) and microbial consortium @ 30 ml/pot promoted growth of *P. deltoides*. The results indicated that combined addition of fly ash, farm yard manure and microbial inoculants can be used as a good potting mixture for improving survival rates and plant growth in forestry nurseries.

Keywords Biometrics · *Populus deltoides* · *Toona ciliata* · Fly ash · Distillery waste · Farmyard manure

Introduction

The desire of an ever-increasing population for improving their living standards necessitated the conversion of agricultural land for non-agricultural applications, intensive cropping with the indiscriminate application of fertilizer/pesticide/irrigation and inadvertent reduction in the forest cover. Implementation of these man-made strategies led to frequent floods and erosion/degradation of soil, cumulatively deteriorating the quality of air, soil, water streams and overall ecological balance. To address these ground realities, application of an integrated plant nutrition system (IPNS) appears to be an effective approach to provide maximum forestry output per unit area, per unit time in a cost-effective and sustainable manner (Tandon 1992). Simultaneously protecting the environment from hazardous waste generation and disposal is a major concern in today's heavily industrialized world (Dermatas and Meng 2003). Agroforestry systems combine trees or shrubs with cropping, with the aim of developing a more productive and sustainable form of land-use (Van and Ong 1999).

In India about 70% of the electricity is generated by coal-based thermal power plants, which produces more than 100 mt fly ash per annum as a by-product (Jamwal 2003) that creates the problem of its eco-friendly disposal. Fly ash typically consists of a variety of trace and heavy metal elements, some essential and other toxic to both plants and animals.

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