Project Profile

Title:	**Treerich biobooster: A novel approach to synergise growth and pest management in fast growing industrially important tree species.**
Principle Investigator:	Dr.S.Murugesan
Co Investigators:	Dr. N. Senthilkumar Dr. V. Mohan Dr. A.C.Surya Prabha
Duration:	3 years 2012-2015
Objectives: 1. To screen the effect of different bioinoculants along with biomanures on growth enhancement of industrially important tree species in nursery. 2. Analysis of the role of mixtures and production of signals in plant defenses. 3. Standardization of nutrient composition and to develop treerich bioboosters.	
Funding Agency:	ICFRE
Summary/Achievements	The present research such aspects as effect of various bioinoculants comprise PGPRs, PPFM, AM fungi along with vermi-compost, decomposed coir pith/vermiculite, effluent biocompost, soil potting mixture, decomposed green manure, neem seed kernel cake, aegle seed cake etc., were critically examined at different mixing ratio as an integrated bio- nutrient management for the quality production of the selected forest tree species viz., *Ailanthus excelsa*, *Casuarina equisetifolia*, *Eucalyptus tereticornis*, *Gmelina arborea*, *Neolamarckia cadamba* and *Tectona grandis*. It was demonstrated that some of the bioinoculant application could appreciably improve the germination behaviour i.e. 24 -100 in our nursery experiments as supplement the primary/ micronutrients like protein, chlorophyll, Ca, N, Ph, Mg, K and organic carbon , and thus reducing the need for fertilizers. The inoculated seedlings shown better performance of biomass with reference to seedling survival, shoot length, collar dia meter at 30- 60 days after application. Increase in growth was the result of cumulative effect of increased phosphate and other mineral uptake, improved water holding capacity of the biomixture due to the added nitrogen and optimum level of physicochemical properties like pH, EC, colour etc. The results indicated that the combined application of three or more beneficial organisms exerted more complimentary effect on growth and productivity than dual or single inoculations. The added effect of Pink Pigmented Facultative Methylotrophs (PPFMs) in the biomixtures influence the seed germination and seedling growth by producing plant growth regulators. Biomanure contains microorganisms which are capable of mobilizing nutritive elements from non-usable form to usable from through biological process. Optimization of bioinoculants at suitable dose is a key factor of importance in influencing the level and availability of nutrients, allelopathic activity, herbivory induced over-compensatory growth, and effective solution to production of healthy forest planting tree resources. Phytochemical profiling in the course of chromatographic analysis revealed that seedling grown in nutrient amended coir pith and vermiculite media elicited additional bioactive compounds which are not activated in control grown seedlings. For example seedlings grown in coir pith based medium elucidated more bioactive molecules than vermiculite based medium and control. The nutrient amendments made in coir pith and vermiculite base media signaled more polyphenol

	compounds in seedlings which induce the seedling growth and promote plant defense against many bio factors. Therefore, the present research was directed to enhance seedling performance and to produce quality seedling for better out planting and improve its ability to survive and re-establishing capacity in the field. The coir pith based potting medium could be considered as a promising potting media for healthy seedling production for improved out planting for the entire tree species selected, and the coir pith based medium has gained prominence as potting medium. Using coir pith based potting media is possible to cultivate plants organically, economically and environmental friendly ways. Some of the bioactive phenolic compounds elucidated were found to be defensive, and hence no infestation was noticed in the seedlings which could ultimately lead to enhance the healthy seedlings production. This is because some of the allelochemicals are known to play a key role, where they induce defensive mechanisms as well as crop protection. Based on the promising results obtained from various experiments, developed an organic rich product named "Tree Rich Booster". The product shows its efficacy on plant growth and biomass of economically important tree species in various experimental studies in the present study. The product was released to the various user growers during "Farmers Mela 2013" organized at IFGTB, Coimbatore.