Response of *Casuarina equisetifolia* and *C. junghuhniana* to *Frankia* Under Field Conditions

A. Karthikeyan
Institute of Forest Genetics and Tree Breeding
Coimbatore 641 002, Tamil Nadu, India
Email : karthika@icfre.org

Abstract

Casuarina equisetifolia Forst. and *C. junghuhniana* Miq. are being cultivated mostly in southern part of India mainly for pulp and paper production and scaffolding for construction. These trees fix atmospheric Nitrogen (N) through symbiotic relationship with *Frankia*, a soil bacterium of actionomycete group. The roots of *C. equisetifolia* and C. *junghuhniana* normally produce root nodules in which Frankia fixes the atmospheric N. Therefore it is essential to introduce *Frankia* in Casuarinas at the seedling stage for better growth and nutrient improvement. In the present study, *Frankia,* cultured in P medium was inoculated in the seedlings of *C. equisetifolia* and *C. junghuhniana* at nursery conditions and assessed for growth performance. Seedlings inoculated with *Frankia* showed improved growth and biomass over uninoculated control seedlings. The N accumulation was also higher (2.7 to 2.9 mg g^{-1}) in *Frankia* inoculated seedlings than control. Inoculated seedlings were planted in a farmer's field at Karaikal Puducherry India, to asses the effect of *Frankia* inoculation in seedlings established and grown. At two years age the growth of seedlings were significantly higher under field conditions without any additional organic or inorganic fertilizers. They recorded a height growth of 8 to 10 m and diameter 3 to 4 cm. It was observed that the soil nutrient status was also improved due to *Frankia*. The survival of the *Frankia* inoculated seedlings of Casuarinas was 94.6% in the field conditions.