

Windbreak Agroforestry systems to make agro-ecosystems as more climate change resilient systems

A windbreak is a narrow row of trees planted in fields bordering a farm plot. Windbreaks on field boundaries effectively control injuries to the tender crops from sand blasting and hot wind. It is reported that it reduces wind velocity by 20-46% and soil loss by 76%. Windbreaks are an important tool for farming in semi-arid areas. Besides crop protection and enhanced productivity, the windbreaks contribute to the organic matter content of the soil through leaf fall. Further, because windbreaks control wind speed behind the barrier, they reduce evaporation from bare soil and transpiration from crops thus making plants behind the windbreak less likely to suffer from moisture stress and reducing the irrigation requirements. By considering the above facts, windbreak Agroforestry system can be promoted to make the agro-ecosystems as climate change resilient system through i) enhanced productivity, ii) reduced evapo-transpiration and in turn increased water use efficiency of the agro-ecosystem iii) reduced crop damage particularly in plantain cultivation in Tamil Nadu and iv) increasing carbon sequestration in biomass and in soil. It is also important to note that Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore recently initiated efforts to select phenotypes of Casuarina which are suitable for developing a windbreak agroforestry system. The selected phenotypes will be useful to address the recurrent problem of crop damages particularly in plantain growing belt of the Coimbatore district, which is caused by strong gusty winds particularly during monsoon period. This damage costs about Rs. 5.0 crores annually. To address this issue, 21 phenotypes were selected by adopting 'Point grading method', while giving greater score for higher productivity, trees having more branches were given additional weighted scores. In this effort IFGTB has now developed productive clones of Casuarina exclusively suitable for windbreak Agroforestry system which will have more number of branches, greater branch thickness, wider branch angle along with greater growth rate and biomass productivity and those clones are proving as suitable clones for windbreak. It is also important to note that windbreak Agroforestry system will not replace the agriculture crops while increasing the tree cover in the state. By considering net cultivated area is around 48.92 lakh ha and 2/3rd of such cultivated area being brought under windbreak Agroforestry system, the area under windbreak Agroforestry system in Tamil Nadu can be around 30.0 lakh ha. On an average 600 trees can be planted in a ha area as three rows of windbreak system all around the farm and approximately 1800 million trees can be planted under windbreak Agroforestry system.



One year old growth of superior clone selected exclusively for windbreak Agroforestry system by IFGTB in the farm field in Coimbatore district, Tamil Nadu



6-months-old growth of superior clones for windbreak Agroforestry system for protecting plantain crop from wind damage