

Sustaining Gains from Long-term Breeding Programmes of Casuarina: Experiences from India

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Abstract

Systematic breeding programmes generally yield high genetic gain during the first few generations partly due to the broad genetic base used and the inferiority of the benchmark accession. Casuarina breeding programmes started in 1997 is among the earliest in India and in a short span of time made a significant positive impact on plantation productivity in the country. The predicted and realized gains were substantial from the first two generations of breeding as evidenced by reports from research institutions, industries and forest department presented in this workshop. The output has justified government's investments in breeding, strengthened international collaboration, encouraged industries to initiate small-scale improvement programmes and created awareness among farmers on the benefits of using quality planting material. The challenge now is to sustain the current level of genetic improvement and the interest generated among stakeholders in the coming years. It is also essential to make use of new knowledge generated during the past 15 years on the genetic structure of Casuarina populations, their reproductive behaviour, improved hybridization and vegetative propagation techniques, plantation and seed orchard establishment and management. The first priority for the next 15 years would be broadening the existing genetic base for breeding through new infusions from unrelated populations. The next important task is to move the breeding objective from a general fast growth of trees to end use-specific traits like high quality pulpwood for paper industries. The dioecious sexual system, compatibility for hybridization across provenances and species coupled with cost-effective vegetative propagation methods support developing clones possessing many desirable traits to maximize plantation productivity and wood quality. The blister bark disease continues to be a threat to long term retention of breeding populations and orchards of *C. equisetifolia* and its recent occurrence in young plantations is a cause for

concern. Fortunately there are provenances and species unaffected by the disease so far providing scope for selection and breeding for disease resistance. Similarly the symbiotic relationship between Frankia and Casuarina need to be integrated into the genetic improvement programme particularly to expand planting in areas prone to drought, salinity and nutrient deficiency. These challenges demand collaboration between different countries supported by international organizations and industries.