

Developing Interspecific Hybrids Involving Four Species of *Casuarina*

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Abstract

A 12 year old species-provenance trial of *Casuarina* with 20 seedlots of six species showed better growth by *Casuarina junghuhniana* and *C. equisetifolia* than by *C. cunninghamiana* and *C. cristata*. *C. obesa* and *C. glauca* were not adapted to the trial site in Coimbatore, India. *C. cunninghamiana* had the best stem form and *C. cristata* had high wood density. Only *C. equisetifolia* was affected by wilt disease throughout the testing period. With the objective of developing desirable hybrid combinations with fast growth and qualitative traits like stem form and disease resistance, control pollination experiments were carried out involving outstanding individuals of the four species. In addition, candidates selected from the second generation breeding populations of *C. equisetifolia* and *C. junghuhniana* were also included as parents. The four species share a common chromosome number ($2n = 18$) and possess overlapping flowering phenology. Pollen could be stored up to 3 months at 4 °C. The extent of fruitset differed among various interspecific hybrid combinations ranging from 0 to 75 %. Fluorescent microscopy showed restriction of pollen tube growth in the stigma of unsuccessful crosses. A potted hybridization orchard has been developed to avoid bagging and to improve fruit and seed set.