SELECTION AND BREEDING FOR FROST AND *FUSARIUM CIRCINATUM* TOLERANCE IN SAPPI'S *PINUS PATULA* X *PINUS TECUNUMANII* HYBRID PROGRAMME

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The Pitch Canker Fungus (PCF) disease, caused by *Fusarium circinatum*, has caused high levels of mortality of the primary commercial species *Pinus patula* in South African forestry nurseries and has also caused poor post-planting survival. Artificial inoculation experiments have indicated low levels of resistance with species such as *P. patula* and *P. radiata*, and higher levels of tolerance with some species and hybrid combinations. The *P. patula x P. tecunumanii* hybrid has largely replaced *P. patula* as the commercial species of choice in South Africa. This hybrid is, however, less cold tolerant than *P. patula* and therefor limits the planting of the hybrid in frost-prone areas. Results are presented on field growth and adaptability, disease tolerance and cold tolerance screening using hybrid families from a large factorial mating design between *P. patula* and *P. tecunumanii* Low and High Elevation parents. Viable seed was put through vegetative propagation via rooted cuttings, and hybrid families were tested as a family mix representing the genetic diversity available for each hybrid family, and hybrid status was confirmed with DNA fingerprinting. Results of the screening have shown a wide range of tolerance for both *F. circinatum* as well as cold tolerance, while a substantial increase in growth has been realized with the hybrid. Wood property studies of older hybrid material have also shown that the wood is highly desirable for both sawn timber and Kraft pulp. General and specific hybridizing abilities (GHA and SHA) were also calculated to identify superior parents for future commercial hybrid families.