Selection of Loblolly Pine Varieties Resistant to Fusiform Rust for Commercial Deployment

Andy Benowicz[1] and Robert J. Weir[2]

Abstract

Commercial production of loblolly pine (*Pinus taeda* L.) varieties through somatic embryogenesis has been increasing significantly over the last several years. Large-scale operational plantations have been established since 2004 across the Southeastern United States, while the oldest field tests are now at mid-rotation. Extensive surveys of fusiform rust (*Cronartium quercuum* f.sp. *fusiforme)* infection rates in over 80 operational varietal plantations and demonstration plots were conducted in eight southeastern states. The surveyed stands were 3- to 9-years old. The operational data confirm that the selection program for rust resistance in loblolly pine varieties has been very successful. Genotypes characterized by fast growth rate and tentative resistance to fusiform rust are identified at a young age in several field test sites. Cryogenic tissue from the selected genotypes is used to produce seedlings for tests involving artificial inoculations. Artificial inoculation tests of CellFor-produced loblolly pine clones have been performed by the U.S. Department of Agriculture resistance screening center in Asheville, North Carolina over the last 8 years. A number of loblolly pine clones of Atlantic Coastal Plains and Western Gulf origin were exposed to high concentrations of fusiform rust inocula. The inocula were developed from aeciospores collected in three regions representing the eastern, central and western distribution range of loblolly pine. The inocula from the three regions were used in separate tests. Commercial varieties ranked as resistant or very resistant, based on field data and artificial inoculation tests, show less than 0.5 percent stem infection rates, based on all 56 surveyed operational plantations and demonstration plots they were present in.

[1] CellFor, 4-6772 Oldfield Road, Victoria, BC, V8M 2A3.
[2] CellFor, Portland, Maine.
Corresponding author: abenowicz@gmail.com.