Disease Resistance and Aesthetic Evaluation of Atlantic White Cedar (*Chamaecyparis thyoides*)

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Since the original cross in 1888, Leyland cypress (x*Cupressocyparis leylandii*) has been planted worldwide. Its rapid upright growth and evergreen foliage make it a popular choice among consumers for windbreaks, hedges, screens, specimens and Christmas trees. However, Leyland cypress is susceptible to at least two fungal pathogens, *Seiridium* and *Botryosphaeria*. These pathogens cause canker development which leads to the death of branches and eventually kills the plant. This it is necessary to search for an alternative needle evergreen with similar aesthetic characteristics but greater disease resistance. A possible plant for this role is Atlantic white cedar (*Chamaecyparis thyoides*).

My research consists of two objectives. The first is to screen Atlantic white cedar clones for resistance to *Seiridium* and *Botryosphaeria*. The second objective is to select superior taxa of Atlantic white cedar for production based on disease resistance, aesthetic characteristics, growth habits and performance in both field and nursery conditions.

The disease screening experiment was initialed in the Fall of 1998. *Seiridium, Botryodiplodia* and *Fusicoccum* were isolated from infected branches of Leyland cypress and grown in pure culture. Plants for testing were vegetatively propagated during Fall, 1997. The disease resistance screening experiment consisted of 4 completely randomized blocks of 60 one-gallon plants. Each block contained 10 single-plant replications of 5 clones of Atlantic white cedar and one Leyland cypress.

Plants were wounded with a wood rasp at a point on the stem measuring approximately 1 cm in diameter. A pre-colonized stem section of Leyland cypress was applied directly to the stem and the area was wrapped in moist cheese cloth, parafilm and aluminum foil. Plants were misted for the first 2-weeks and water stressed inside the greenhouse for the remainder of the experiment.

Plants were monitored for symptoms of canker formation including discoloration, sunken tissue, callus formation and resin flow. Final measurements were taken 8 weeks after inoculation and included height of the plant, caliper at the wound site, length and width of the surface canker and length, width and depth of the interior canker. The experiment was repeated during the Spring of 1999.

Results indicate that *Seiridium* is more pathogenic than *Botryodiplodia* and *Fusicoccum* on the clones of Atlantic white cedar and Leyland cypress tested. Symptoms of *Seiridium* infection of Leyland cypress and Atlantic white cedar differ in that Leyland cypress exhibits a large, sunken, resinous surface canker whereas infected Atlantic white cedar clones show minimal surface damage. Atlantic white cedar clones tested were just as susceptible to *Seiridium,*

Botryodiplodia and *Fusicoccum* as the Leyland cypress.

For screening, a collection of 54 taxa of Atlantic white cedar was assembled from its native range along the eastern seaboard of the United States. Forty-three taxa were planted at the University of Georgia Horticulture research farm in Oconee County, Georgia in a completely randomized design with three single plant replications. Plants were measured for height and width at the times of planting and every three months thereafter. Plants were evaluated for habit, foliage color and needle retention.

Three to five single plant replications of 26 taxa of Atlantic white cedar were planted in three-gallon containers at the Center for Applied Nursery Research in Dearing, Georgia in March 1997. Seventeen taxa were added to this collection in April 1998. Plants were grown in full sun under standard nursery conditions. Height and width data were recorded, and plants were evaluated for habit, foliage color and needle retention.

Atlantic white cedar clones display a wide variety of growth rates, growth habits and colors. Plants evaluated have been divided into three growth categories: fast (85 to 111 cm per season in containers and 106 to 143 cm per season in the field), medium (50 to 80 cm per season in containers and 68 to 103 cm per season in the field) and slow (20 to 43 cm per season in containers and 21 to 47 cm per season in the field). Growth habits of Atlantic white cedar clones include upright, conical, spreading, weeping and prostrate forms. Foliage colors include blue (representative of the northern taxa), green (representative of the southern taxa), and yellow and variegated.

The following taxa have been selected as superior forms and are recommended for production. ‘Blue Sport’ and ‘Glauca Pendula’ are two superior, fast growing blue cultivars. Dirr seedlings #1 and #2, ‘Emily’ and ‘Rachel’ are upright, conical, green forms with medium to fast growth and the most promise as Leyland cypress alternatives. ‘Andelyensis’, ‘Meth Dwarf’ (probably synonymous with ‘Little Jamie’ and ‘Top Point’) and ‘Red Star’ (‘Rubicon’) are slow growing dwarf forms with potential as container garden plants and miniature Christmas trees.