



2BILLION TREES

2 BILLION TREES SCIENCE

Research in Support of Tree Planting

NOTE 1

Resilience of western redcedar to climatic extremes (drought)

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CFS CENTRE:

Canadian Wood Fibre Centre

PROJECT LOCATION:

Victoria, BC

Project Drivers

The 2 Billion Trees (2BT) program aims to increase tree resilience and survivability through research on tree improvement. Selecting seeds for tree planting that are resilient in different environments and stressful conditions will enhance tree survival and growth after planting. Western redcedar (*Thuja plicata*) is a species of major ecological and economic importance. It is also particularly relevant to Indigenous cultures. It is a long-lived tree with durable wood, presenting long term advantages for storing atmospheric carbon. However, climate change is negatively affecting this critical species, impacting soil moisture levels and leading to more intense drought. Increasing evidence of western redcedar decline highlights the importance of selecting climate resilient trees for the 2BT program. This project will identify genetic families of western redcedar that are resilient to drought, supporting long term tree survival and the continuous benefits of these planted trees.

Project Approach

This project will identify seed sources that are able to balance tree growth with tolerance to stress factors. This research project will test and select full-sibling families of western redcedar for resilience to drought. Ninety different genetic families will be subject to study. An estimated 3,000 to 4,000 seedlings grown under controlled greenhouse conditions will be planted and subjected to two treatments: optimal moisture vs. drought conditions. This project will measure trees for performance under stress using differing water conditions. It will also examine how drought affects tree nutrient levels for different genetic families and soil characteristics.

Anticipated Outputs and Impacts

This research will support the selection of western redcedar genetic seed sources that are resilient to climate extremes for the 2BT program. It will also inform tree breeders on strategies used by western redcedar to cope with drought. Families identified as tolerant to drought can be quickly incorporated into decisions on seed production in seed orchards, supporting seed supply for reforestation and afforestation for the program. This project will also identify nutrient deficiencies induced by drought, which can be mitigated by targeted fertilization when planting to ensure better growth and survival. Identification of soil characteristics impacted by drought will inform the selection of better sites for planting, as well as identify site preparation that will improve soil conditions.

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