BC Coastal Hem-Fir Initiative – 2012/13

Project Title	Kiln Drying Western Red Cedar (WRC) Products
Project Number	C.05
Project Leader	Luiz Oliveira
Project Team	Diego Elustondo, Liping Cai, Vit Mlcoch, Bryce Granger
Total Budget	$80,000

Need(s)

Western Red Cedar (WRC) (*Thuja plicata Donn)* is extensively used for outdoor applications such as house siding, decking, fencing as well as for indoor applications such as furniture, paneling, doors, windows to name just a few. It occurs in coastal British Columbia and in some wet areas of the interior. It grows in stands where hemlock and Douglas fir are found. WRC is prone to ***collapse*** during kiln drying. Thus, producers of kiln-dried WRC normally exercise caution especially during the early stages of the drying process when the risk of collapse is greater. Kiln drying processes are in general conservative and temperatures used are in the range of 120 to 140 °F (the latter being used towards the end of the drying process). Some WRC lumber is also known to have 'wet pockets' which in turn, slows the drying process even further and potentially affect uniformity of final moisture content of a particular product. Non-uniformity of final moisture content can compromise the quality of products used in indoor applications and therefore reduce value. Drying times for 2-inch high quality products can take 10 to 15 days. In addition to increase processing costs, those long drying times may significantly reduce WRC competitiveness when compared to other species. Thus, to compete with other products and expand its utilization, WRC producers need to explore opportunities to reduce drying times without compromising the quality of the final product. Today's drying technology offers several features such as in-kiln moisture monitoring equipment and advanced control systems that can potentially be used to optimize WRC drying schedules that were developed in the past. In addition, the availability of different technologies for green sorting (sorting prior to drying) offer the opportunity to employ drying schedules according to the characteristics of the sort of green lumber being dried. Also, besides conventional kiln drying, technologies such as superheated steam/vacuum drying (SS/V) have been successfully used in Europe and Asia to dry products with characteristics and quality requirements similar to WRC.

Objectives & Approach

The objectives of the proposed project are:

- To evaluate variations of drying schedules to:
  - Produce faster drying (increase productivity and reduce processing costs)
  - Eliminate collapse during kiln drying
- To evaluate the impact of green sorting on drying characteristics of WRC
- To evaluate technical and economically feasibility of using SS/V drying for high-value WRC products.

Benefits

The project will be designed to have duration of 1 year. In addition to better uniformity of final moisture content and higher grade recovery, it is expected that drying times can be reduced by 20 to 50%. Past

experience with superheated steam/vacuum drying indicated potential reductions of 30 to 50% of the total drying time without compromising quality results for species with similar characteristics of WRC. Thus, potential benefits are as follows:

- Improve competiveness;
- Possibility of re-entering certain markets with some products (supplying dried products);
- Increased productivity;
- Reduced energy consumption;
- Improved quality

The specific impact of the benefits listed above will vary amongst mills and therefore it is difficult if not impossible to generate an accurate dollar figure. On the other hand, it was clear from numerous discussions with mill representatives that in some cases individual mills might increase annual revenue in the range of $300,000 to $800,000.

Project Tasks and Outputs – Current fiscal year

Tasks / Outputs	Expected Delivery Date
Drying schedule review	June 2012
Sorting tests	September 2012
Kiln drying tests	December 2012
SS/V drying tests	March 2013
Final Report & Results Presentation	March 2013

Status and Major Accomplishments – Previous year

New project

Performance Measures

Key Success Factor	Key Performance Indicator	Target	How the outcome of the Project supports the Program objectives
• Increase in productivity • Quality improvement	• Reduction of processing costs • Productivity increase ratio • Lower number of drying defects	• 20 – 50% reduction drying times	• Energy consumption • Reduction of the impact on environment • Improved competitiveness • Reduced drying costs

Communication Strategy for Information Dissemination

Several activities within each project phase will be carried out in collaboration with participant mills. Thus, in addition to formal communication of results (progress reports, final reports and presentations), several meetings with industry representatives will be used to transfer results. The main types for disseminating results and findings to the industry will be:

a) Final report
b) Summary reports (Technical notes)
c) Publications (peer reviewed)
d) Seminars

Collaboration – Research Partners

- Western Forest Products
- Teal Jones
- Interfor