PROGRAM: HARVESTING AND CONVERSION PROGRAM

PROJECT #: H.03

PROJECT TITLE: Benefits of Including Surface Defect Detection in Edger and Trimmer Optimization at BC Coastal Sawmills

PROJECT LEADER: Joel Mortyn

Abstract

The objective of this project was to quantify the potential value gain that is achievable by adding surface defect detection to board scanning systems in edger and trimmer optimization at BC coastal sawmills.

The study used data from 160 western hemlock cants and sideboards from two sawmills located on Vancouver Island. The samples were first profile scanned and optimized based on the geometric shape using the sawmills' edger profile scanners. The boards were removed from the lines without edging and the profile-based solutions were recreated onto the surfaces using laser lines at FPInnovation's laboratory in Vancouver. The resulting lumber was graded and priced. The edging and trimming decisions were then manually adjusted to maximize the potential value recovery by accounting for surface defects and the resulting pieces were graded and priced. A subset of boards was scanned using the vision technology Bioscan™ to compare the defect detection ability of an existing scanner with human vision.

Modifying the edging and trimming decisions from the profile optimized solutions would have resulted in a value gain for 77 of the 160 cants and sideboards sampled from both mills. For 50 of the 63 cants sampled from the Nanaimo sawmill, altering cutting decisions to account for surface defects would have increased lumber value by 33.8%. Improvements were possible for 27 of the 97 sideboards from the Saltair sawmill, with an overall value gain of 8.3%. Surface defect recognition was responsible for increasing the value of only one board from the Saltair mill. The value increases of the remaining 26 boards were a result of calibration and wane detection issues relating to the scanner. The contrasting results for the two samples were attributed to differences in log supply, board width and the lumber grades considered at the sawmills.

For nine sample boards scanned using Bioscan™, 92% of knots appeared on scan images. Other surface characteristics such as heart stain and chain burn also appeared as defects in the scan images, preventing the optimization of product outturn. This issue may be minimized with proper machine calibration for this species. These results demonstrate that a significant amount of the identified value gain could potentially be realized using an existing technology.

Keywords: western hemlock, scanning, optimization, defect detection, value recovery, lumber recovery

Contact:

Joel Mortyn
FPInnovations – Forintek

Email: joel.mortyn@fpinnovations.ca