



Picture bigger profits with new vision scanning systems

FORESTRY INNOVATION INVESTMENT

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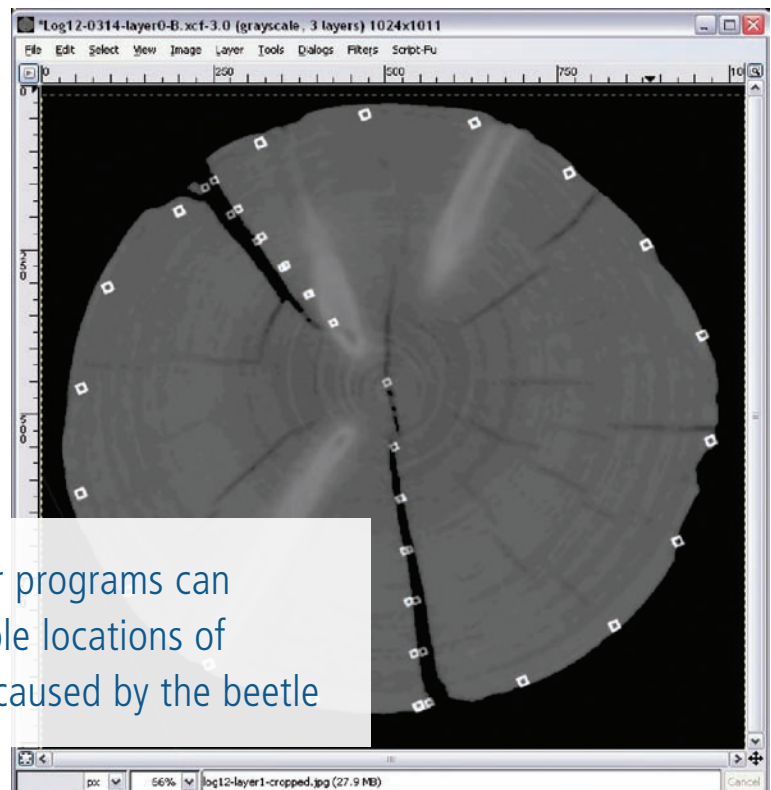
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MOUNTAIN PINE BEETLE

Scanning and defect-detection systems could significantly reduce sawmill losses experienced when processing mountain pine beetle-killed wood, researchers have found.

A study by FPInnovations-Forintek used true shape scanners and semi-automated check detection on sample logs to create and process timber in a sawmill simulation program. Results suggest that a sawmill processing 900,000 cubic metres of logs a year, of which 25% are damaged by the beetle, could gain almost \$3 million a year by using new or emerging machine vision systems, and slightly more if check detection is used in trimming and edging.

The key is identifying and reducing areas where waste occurs. This study looked at existing systems for estimating the most productive cuts to a log, as well as emerging machine vision technology and true shape scanning technologies to calculate how much more of each log might be salvaged. The researchers found that by increasing the accuracy of machine vision systems (cameras that relay pictures of the log so that it can be cut efficiently) and check modeling

(computer programs that calculate the most probable locations of internal checks or cracks caused by the beetle), sawmills could reduce their loss of log volume from \$46/m³ to \$38/m³.



Check modeling computer programs can calculate the most probable locations of internal checks or cracks caused by the beetle

The size, location, and depth of checks affect final lumber grade and value recovery. If logs with checks are rotated so that the check is at 12 o'clock or 3 o'clock as they enter the saw mill, significantly more lumber can be produced.

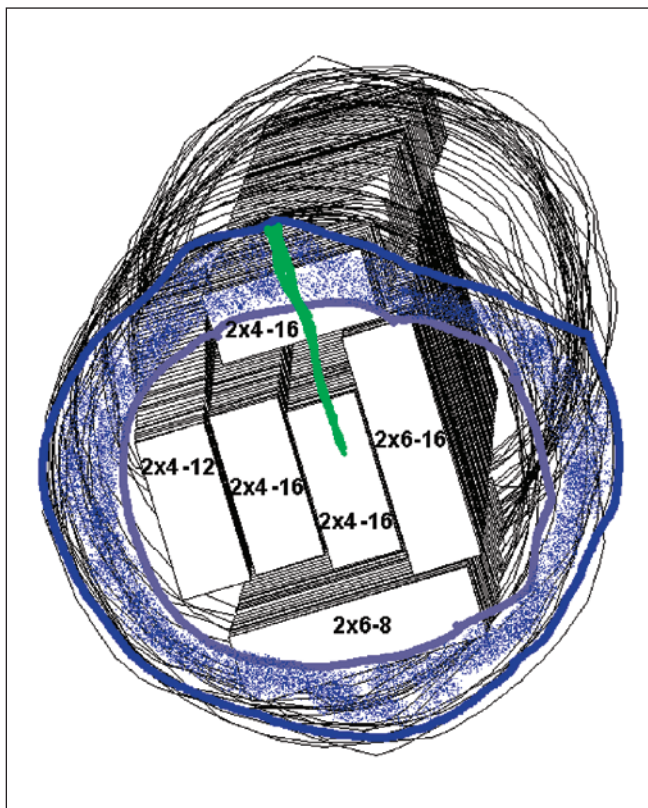
Machine vision systems use cameras to view up to three locations on logs - front end, back end and along the length for external checks. Prediction of internal checks is also important, and can be achieved using corrected regression equations.

In the study, 45 beetle-killed logs with heavy checking were selected. Each log was measured and an accurate representation of its surface and its checks was made. A scan of the log helped develop virtual images (models). Using these models four scenarios were simulated (using one, two or three camera images).

The most efficient system tested used a machine vision system with cameras that collected images of checking from the surface and at both ends of the log, and used a corrected regression equation to estimate check depth. Adding further defect detection systems at edging and trimming areas of the mill increased the proportion of salvageable wood.

Researchers recommend that machine vision systems collect check data from both ends of the log as well as the log surface, and that check data be augmented by corrected regression estimates. Any other configuration should be examined carefully regarding its ability to actually save the sawmill real dollars. It is also recommended that the application of mechanical vision systems that have lessened the cost of loss from beetle-affected logs should be investigated to improve the process further.

FOR THE FULL REPORT GO TO WWW.BCFII.CA/MPB/
AND DOWNLOAD THE REPORT "MPB-07-016:
CHECK MODELING FOR MPB LOGS."



Forestry Innovation Investment is a British Columbia government corporation investing in initiatives to help market BC forest products and promotes our sustainable forest practices to the world. FII's Mountain Pine Beetle Program supports the government's Mountain Pine Beetle Action Plan and its objective to maximize the economic value of mountain pine beetle wood. FII does this through marketing activities and research into new products and manufacturing processes for mountain pine beetle wood.

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