PRODUCTIVITY IMPACTS OF BUNCHING FOR YARDER EXTRACTION

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Abstract: *Bunching of trees to improve payload in harvesting is not a new phenomenon and has been reported extensively in both ground-based and cable hauler operations worldwide to increase extraction machine productivity. A study was undertaken to better understand the extent to which bunching of trees for yarder extraction is used currently in New Zealand. There were three objectives of the study: i) to gather information on steep country bunching operations in terms of terrain and duration, using a daily data collection form; ii) to identify yarder crews for subsequent study; and iii) to investigate the impacts of tree bunching on cable yarding productivity through detailed productivity studies. From the shift level data collection, the conclusion was drawn that for some operations, bunching of trees for hauler extraction can be used up to 80% of the time and on various terrain slopes (up to and exceeding 22 degrees) when conditions permit. Two crews were later studied in detail: the first study was of a swing yarder operation with manual felling of 2.26m3 trees and bunching using a Sumitomo SH300 excavator loader; the second study describes a Madill 071 tower operation with manual felling and bunching of 1.02m3 trees using a Komatsu PC300 excavator loader. Results for both studies showed that significantly more trees were hooked on per cycle for bunched versus unbunched trees. Shovelling and bunching for yarder extraction improved yarder utilisation and harvesting system productivity. A comparison of predicted performance showed that extraction of bunched trees resulted in more than 24% increase in harvesting system productivity and a minimum of 5% decrease in harvesting costs per cubic metre.*