The importance of the forwarder operator in loading phase during virtual CTL-forwarding

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Abstract:
Variation in productivities within experienced harvester operators can be even 40-50 %, whereas the differences increase still between beginners and experienced operators. So far, the so called tacit knowledge of harvester operators has been studied widely whereas the operator studies of the forwarder work has been minimal. Forest machine unit's productivity level has a remarkable role in the cost efficiency and profitability of mechanised CTL- loggings. Objectives of the forwarder simulator study were to investigate the impact of different productivity factors on the loading sequence of the forwarder work.

Ponsse's MetSimulator CTL-forwarder simulator was chosen for the study. Simulator environment enabled to construct completely similar working conditions for all forwarder operators. Ten operators were chosen for the study. Five operators were categorised as experienced and another five as students. The work studies of the forwarder work were carried out in two logging environments; in one final felling and in one first thinning work sites. In both work sites amount of timber was one full load of forwarder.

Data consisted coordinates of load space and the tip of boom and was updated every 20 milliseconds. Data analysis was focused on the effective boom movements. Main factors to be calculated were time per work cycle, length of trajectory of boom tip, average velocity of boom tip and parallel and perpendicular distances from pile to center of load space.

Significant difference was found between operators in time consumption. Big variation between operators can be found both in the velocity and the length of trajectory of boom tip. Relatively big differences in loading performance were found between professional and student operators, but also within the groups. In order to improve the productivity during loading, the keys are to increase the velocity of boom tip or to shorten the length of trajectory of work sequence.

Keywords: Forwarding, Operator, Simulator

Remark: Full paper has not been submitted.