Contribution 117 in session “From traditionnal to automated work studies“

Analyzing forwarder operation by consumer-grade GPS in mountainous conditions

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The potential of Global Positioning System (GPS) in forestry applications has been already proven. Even if the use of GPS under forest canopy is problematic in terms of performance and accuracy, its installation on forest machineries is considered an innovative technology to extract basic information such as point to point distance, traveled distance, mean and instant speed, cycle time. On behalf of these prospects, the use of consumer-GPS is also considered a remarkable application because of the considerable cost advantage compared with high-precision GPS alternatives.
This study analyzes the possibility to use consumer-GPS device to monitor vehicle motion and performance during forest operations. The case study focuses specifically on forwarding operations in mountainous conditions. For this reason different forwarder operations have been investigated both in Italy and in Slovenia.
Data collection is based on the simultaneous use of a consumer-GPS mounted inside the forwarder cabin and a hand-computer with dedicated software for the time study. For each working sites, GPS data are analyzed and coded with the simultaneous time studies. As a consequence the recorded GPS data were grouped and identified in relation to the forwarder cycle. The subsequent synchronization of the GPS data let to identify the cycle elements by splitting the cycle time into the productivity time elements on the base of the speed variation and the location of the machine respect to the landing sites.
The discussion of the results will present the strengths and weaknesses on the use of consumer-GPS for the evaluation of the forwarder operation under mountainous condition.