

ASSESSING THE PERFORMANCE OF A CABLE CRANE USING SINGLE CABLE

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Abstract: *The geographical make up of Italy, in especially Piedmont, with steep valleys, rocky landscape and poor road network, favours the use of aerial transport like cable-crane system. This system guarantees a very high working rate but also needs a lot of time in assembling and dismounting equipment and it is very labour intensive. A solution for transporting logs from the forest and potentially reducing these disadvantages is the use of cable crane engine, which can move autonomously on bearing cable without the need for drawer cables.*

The aim of this study was to evaluate the performance of one of these systems by analysing its labour requirement and working rate in different working yards.

The tested cable crane system was a Woodliner 3000 which move on a 22-mm diameter carrying cable by the traction generated with double wheel drive engine (480 mm diameter). It had a 72kW Diesel motor. Two operators controlled the system, one at loading and the other at discharging location. It is a remote controlled self driving machine.

Data was collected in four different yards. The production of the working yards was determined by measuring the stocked timber volume. Operative and economical values of this new method and the traditional system (cable crane system with mobile control station) were compared too.

The cable crane engine system was found to operate with lower labour requirement per biomass unit (0,28hUL/mst) as compared with the traditional system (0,72 hUL/mst).

The working rate in the different yards was independent of the inclination of the carrying cable and proportional to the diameter of single transported logs; however it was negatively influenced by the length of the cable. The higher working rate of 3,5 t/hUL was obtained in lines of less than 100 m length, while the lower working rate of 2,5 t/hUL was obtained on more than 250 m lines. The main advantages of this innovative log-transport system are the reduced labour requirements (less than 60% of the traditional cable crane) and the overall reduction of the logging-transport cost (5,61 €/mst), which is equivalent to about 55% of the cost of log-transport with mobile engine station.