PERFORMANCE IN TWO HARWARDER LOGGING METHODS IN FINAL FELLING

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Can harwarders challenge the harvester-forwarder system?
The harvester-forwarder system has dominated the cut-to-length logging operations for approximately 30 years. The system’s productivity development (m$^3$/h) stagnated about a decade ago. Consequently, evaluation of alternative systems is important. One alternative is the harwarder, a single-machine-system combining harvester and forwarder work, which hitherto has failed to establish a market position, but new solutions may improve its competitiveness. The harwarder’s strength is the ability to directly load logs as they are cut and thereby eliminate the traditional forwarder work element “loading of logs from the ground”. Skogforsk has done comparative time studies on the Komatsu X19 harwarder prototype and a harvester-forwarder system of equivalent size. The systems show similar logging costs, which is surprisingly good for a prototype. This has motivated further investigations. Developing improved working methods is one way to improve productivity.

Alternative logging methods for harwarders
Harwarder operators usually work inside the logging edge when harvesting and thereby they harvest trees both in front and at the side sectors of the machine, Method A (Figure 1). This method demands complex crane work but requires relatively short driving distance.

An alternative is to harvest only at the side sector of the machine. In this alternative method, Method B (Figure 2), the operator does not need to pull and/or align harvested stems to the machine. Driving distance to get a full load will increase but crane work is facilitated (cf. Figures 1 and 2).

Material and methods
The two methods were compared through a conventional time study. The harwarder was driven by two operators in a pine dominated final felling in South Sweden. Time study data were collected manually while produced volumes were retrieved from the harvester production (.hpr) files. Study data will be analyzed during spring 2018.

Results and discussion
Preliminary results will be presented together with a discussion about the consequences of the results and possible next steps for development of the harwarder concept in cut-to-length-operations.
Figure 1. Method A

Figure 2. Method B.