37. FELLING HEADS VS HARVESTER HEADS IN BIOMASS HARVESTING FROM EARLY THINNING

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Introduction
To increase the productivity of small tree harvesting, multi-tree harvesting heads have become a popular option for so-called energy thinning. Multi-tree harvesting heads are now available on the market in a large number of brands and models. Some of the models are developed and modified from simple felling heads, now capable of felling and accumulating several trees in each crane cycle. Other models are modified single grip harvester heads, capable of felling, delimbing and bucking several trees in each crane cycle.

Aim of study
The aim of this study was to compare the efficiency of accumulating felling and harvester heads in biomass production from very dense mixed stands of pine and birch, where proper tending had been neglected and regular tending or thinning would not be feasible. Two different types of accumulating felling heads (Naarva-Grip 1500-40E, Bracke C16.a) and one type of accumulating harvester head (Log Max 4000B) were studied.

Figure 1; The heads used in the study. From the left; Bracke C16a, Log Max 4000B, and Naarva-Grip 1500-40E.

Results and discussion
The productivity was in the range 2.5-3 metric ton dry matter per effective hour in the stands with the smallest average tree size (4-9 kg dry matter per tree), and in the range 3.5-5 ton d.m. per effective hour in the coarser stands (17-19 kg d.m. per tree). There were significant differences in the productivity between the machine configurations, but the study layout prohibited a reliable statistical comparison. The disc-saw based felling head (Bracke) seemed to be the most efficient head in stands with the smallest tree sizes, while the modified harvester head (LogMax) was most efficient in the coarser stand. The latter statement is congruent with findings in other comparable studies.

Keywords: *Energy wood thinning, time studies, productivity, accumulating harvesting heads*