Assessing the efficiency of debarking harvesting heads

THE DEBARKING HEAD PROJECT

Project background
- About 50% of harvested wood in Germany is processed with fully mechanized systems
- Extended discussion about nutrient removal out of forest ecosystems
- Many advantages through possible in-stand debarking
- Debarking harvesting heads are state of the art in intensively managed eucalyptus plantations
- Similar technological innovations have the potential to address modern challenges in Central European forests

Objectives
- Evaluate time and monetary profits/losses of harvesting heads with debarking capabilities under Central European conditions (KWF)
- Assess the influence of vegetation season, tree species and tree form on the debarking percentage after technical modifications
- Quantify the debarking percentage via the development and use of automated measurement systems (PHD)

First findings
- First tests showed that the vegetation season has an impact on debarking percentage (about 40% lower in wintertime for softwood)
- Hardwood and softwood respond similarly
- Curviness and large branches seem to have an influence on wood damage and debarking percentage

THE PHD SETUP

1. Trees are felled and processed with a single grip harvester equipped with a modified harvesting head able to debark (fig. A and B).
2. The processed logs are placed side by side on the forest road (fig. C).
3. Every log is scanned with a terrestrial laser scanner (LiDAR) and a picture is taken before transferring the data in innovative software systems, developed in the project, which are able to measure the debarking percentage.
4. The debarking percentage and quality are currently evaluated with a photo optical software (fig. D). In addition, a second software will be developed to assess data derived from terrestrial LiDAR. The automation of these measurement systems is prioritized.

MAIN STEPS OF WORK PROCESS

Advantages of in-stand debarking
- More nutrients remain in the forest
- Stems are less attractive as habitat for pine bark beetles
- Reduced ash-content and fine dust outtake of firewood
- Potential monetary profits