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Biomass production from mallee agroforestry plantations in Western Australia

Authors: Spinelli Raffaele, Brown Mark, Giles Rick, Huxtable Dan, Laina Relaño Ruben, Magagnotti Natascia.

CNR-IVALSA, Italy, magagnotti@ivalsa.cnr.it

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The research tested two alternative harvesting chains on a mallee agroforestry plantation in the shire of Katanning (Western Australia). Both systems were based on versatile forest technology commonly used for conventional logging operations. They differed for the felling technology: small-scale drive-to-tree or industrial swing-to-tree equipment. Eight belts were divided in 24 blocks, each 90 m long. Both systems were tested side-to-side on 12 experimental plots each. The resulting harvesting cost was 14 and 17 €/t, for the industrial and the small scale system, respectively. The mallee were chipped with an industrial drum chipper powered by a 400 kW diesel engine and mounted on tracks. Chipping represented between 60 and 80% of the overall harvesting cost, and offered much room for improvement. The industrial system always offered the lowest harvesting cost, regardless of annual usage, when equipment mobilisation costs were not considered. The small-scale solution represents the alternative where the farmer prefers to fell and forward the trees with internal resources, rather than calling for a specialised contractor. The productivity of conventional forestry equipment was strongly dependent on belt stocking and tree size. If the diameter at ankle height dropped below 10 cm, economic viability decreased very rapidly.