

## Abstract

# Direct Assessment of Biomass Productivity in Short Rotation Forestry (SRF) with the Terrestrial Laser Scanner (TLS). Case of Study in NE Part of Romania (Preliminary Results) <sup>†</sup>

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**Abstract:** Short rotation forestry (SRF) provides an important supply of biomass for investors in this area. In the NE (North-East) part of Romania at the present time are installed over 800 Ha of this kind of crops. The SRF enjoys the support through environmental policies, in relation to climate change and the provisions of the Kyoto Protocol to reduce the concentration of CO<sub>2</sub> in the atmosphere. A precise estimate of biomass production is necessary for the sustainable planning of forest resources and for the exchange of energy in ecosystems. The use of the terrestrial laser scanner (TLS) in estimating the production of above ground wood biomass (AGWB) of short rotation forestry (SRF) brings an important technological leap among indirect (non-destructive) methods. TLS technology is justified when destructive methods become difficult to implement, and allometric equations do not provide accurate information. The main purpose of the research is to estimate the biomass productivity on tree parts in short rotation forestry with TLS technology. Measuring the hybrid poplars crops by TLS may have the following consequences: (1) Higher accuracy of the estimate of biomass production in the SRF; (2) cost and time effective measurements over the biomass of tree parts; (3) new and validated allometric equations for SRF in NE Romania; (4) solid instrument for industry to estimate biomass. TLS technology gives accurate estimates for DBH, tree height and location, as much as the volume on segments, commercial volume or crown volume can be determined. The accuracy of these values depends on the original scan data and their co-registration. The research will contribute to the development of knowledge in the field of hybrid crops.

**Keywords:** ground-based LiDAR; hybrid poplar crops; estimation of biomass production; advantages and disadvantages of TLS

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