

Morphology and growth periodicity of plantation grown limba trees (*Terminalia superba* Engl. & Diels)

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This master thesis research (2007-2008) quantified growth periodicity and morphological characteristics of limba in order to estimate the productivity of plantations in the Mayumbe (Bas-Congo). Limba is an indigenous fast growing pioneer in a big part of West and Central Africa. It occurs in natural and antropogenic formed forest gaps. The famous limba stands of the Mayumbe have been dramatically overexploited during the colonial period. Therefore, between 1948 and 1956, more than 55.000 ha has been replanted following the sylvicultural system *Uniformisation par le bas* from which more than 12.000 ha were agroforestry plantations (*système sylvo-bananier*). Today, these plantations are almost 60 years old and the trees have reached maturity. Part of these plantations are officially protected in the Luki reserve (MAB UNESCO, INERA). Because of its fast growth and easy (artificial) regeneration, limba is a perfect species for reforestation programmes (e.g. WWF) in its natural distribution area. In order to plan management strategies, growth periodicity and productivity have to be estimated.

In february and september 2007, an extensive inventory of the remaining limba stands was conducted within the framework of a WWF project and the PhD of ir. Maaike De Ridder (University of Ghent, RMCA). In transects covering 1% of the plantation surface, all circumferences above buttresses were measured. From a subsample, total tree height and commercial stem length were measured with a Blume-Leiss dendrometer. From 11 felled limba trees, crown length and branch characteristics as well as stem circumferences on different heights were measured. From 36 trees, wood cores (from bark to pit) were taken with a Pressler core borer. Tree-ring widths were measured, chronologies were synchronized and a final significant mean chronology was found.

The inventory resulted in a rather low residual stem density (33 ha⁻¹) but a high circumference above buttresses (190 +/- 58 cm). Stem and crown characteristics allowed to quantify form parameters and biomass repartition within a limba tree. Crown, stem and buttresses comprise respectively 21, 73 and 6 % of the total height and 4.4, 90.3 and 5.3 % of the total volume. A production curve was calculated from individual tree characteristics, inventory results and the mean tree-ring chronology. The maximum mean annual volume increment is rather high (9.4 m³ ha⁻¹ yr⁻¹) and occurs at an age of 46 years. This is the ideal rotation age for limba trees on similar soils. The plantations are now approximately 53 years old and carry a commercial harvestable wood volume of 157 m³ ha⁻¹. Concerning the low residual stem density, this is a rather high yield.