Analyzing the characteristics that define tree ideotypes for agroforestry systems

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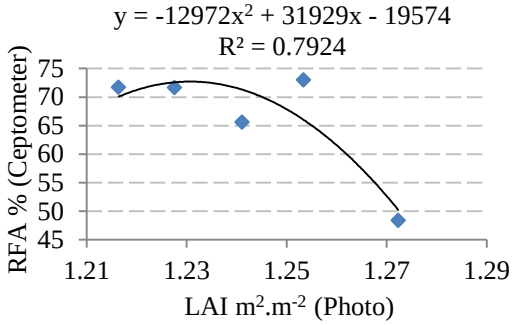
Introduction. In Crop-Livestock-Forest systems, tree species characteristics, such as canopy architecture, growth, shape of stem and leaves, must be assessed in order to optimize production of other components within the system. In agroforestry systems, the set of characteristics that delineate a tree ideotype, or ideal tree type, should consider radiation availability, which must be greater than 50% in full sun (VARELLA et al., 2012) so that the level of photosynthetic activity of temperate forage crops species does not change. This study aims to develop a methodology to evaluate light restriction percentage reaching the forage canopy in such systems.

Material and Methods
We assessed the relationship between photosynthetically active radiation (PAR) transmittance under the tree canopy and the leaf area index (LAI) in a 5 year-old agroforestry system with *Eucalyptus* sp trees planted at a spacing of 20 m x 3 m. We used hemispherical photographs processed in Hemiview® to assess LAI, and PAR was measured using the Accupar LP 80 ceptometer, within and outside the system. Hemispheric photographs and ceptometer measurements were taken every two meters along a transect of 30 m arranged transversely to the rows of planted trees, at a height of one meter above ground level.

Results and Conclusions
The results show 75% correlation between the variables. A 2nd degree polynomial provided an accurate representation of the dispersion of the points, with an R^2 of 0.79. We believe that by integrating more data, including other spacings and ages of various *Eucalyptus* species (including clones and hybrids) will further validate the equation and its use in choosing ideotypes in agroforestry systems. From this equation, the percentage of PAR in a given could be obtained without the use of a ceptometer.



Photosynthetically active radiation transmittance measured with a ceptometer *versus* leaf area index measured with fisheye photos. Points represent the mean of three measurements.

Reference cited
Varella, A. C.; Silva, V. P. da; Ribaski, J.; Soares, A. B.; Morais, H.; Moraes, A. de ; Saibro, J. C.; Barro, R. S. Estabelecimento de plantas forrageiras . In: R. S. Fontaneli; H. P. dos Santos; R. S.Fontaneli. (Org.). Forrageiras para integração Lavoura-Pecuária-Floresta na região sul-brasileira. 2ed.Brasilia: Embrapa, 2012, p. 01-544.