

We are unable to supply this entire article because the publisher requires payment of a copyright fee. You may be able to obtain a copy from your local library, or from various commercial document delivery services.

From Forest Nursery Notes, Winter 2011

184. © Morphological and photosynthetic alterations in the Yellow-ipe, *Tabebuia chrysotricha* (Mart. Ex DC.) Standl., under nursery shading and gas exchange after being transferred to full sunlight. Endres, L., Camara, C. A., Ferreira, V. M., and Silva, J. V. *Agroforestry Systems* 78:287-298. 2010.

Morphological and photosynthetic alterations in the Yellow-ipe, *Tabebuia chrysotricha* (Mart. Ex DC.) Standl., under nursery shading and gas exchange after being transferred to full sunlight

Laurício Endres · Celene A. Câmara ·
Vilma M. Ferreira · José V. Silva

Received: 12 February 2009 / Accepted: 11 May 2009 / Published online: 30 May 2009
© Springer Science+Business Media B.V. 2009

Abstract The objective of this study was to evaluate the effect of nursery shading on the Yellow-ipe seedling (*Tabebuia chrysotricha*) growth, photosynthesis, and photosynthetic acclimation after being transferred into direct sunlight. The Yellow-ipe seedlings were grown under 0, 50, 70 and 95% shade. At the 134th day of sowing, leaf gas exchange and chlorophyll were measured under current growth shading, after exposure to 15 min and two day full sunlight. With the increase of shading, the Yellow-ipe seedlings allocated more biomass to the stem and leaves and less to the roots, and there was an increase in the leaf area ratio and specific leaf area. In relation to 0% of shading there was a increase of 211% in stem, 116% in leaf, and a reduction of 200% in roots biomass when seedling were grown under 95% of shading. The total biomass accumulation had a high correlation with collar diameter ($r = 0.96$). More than 70% of the shading reduced the photosynthesis, and after transferring the seedlings into full sunlight, more than 50% of the shading induced a reduction in chlorophyll, stomatal conductance, photosynthesis and instantaneous carboxylation efficiency, suggesting the presence of a photoinhibition process. The

Yellow-ipe seedling growth under nursery conditions should not be done under more than 50% shading, which may result in the lower seedling quality and poorer acclimation to transplantation, particularly to severe degraded areas with direct sunlight. The species can be used for recovering from totally devastated forest areas to initial recovery when full canopy are forming.

Keywords Seedling growth · Shading · Atlantic forest · Leaf morphology · Afforestation · Bignoniaceae

Introduction

Domestication of wild plants needs efforts focused particularly on the development of the theoretical basis of the physiological responses of plants to environmental stresses, since agroforestry systems are intended mostly for areas with environmental limitations to plant growth (Vilela and Ravetta 2000). Light, water, temperature and soil conditions are the environment conditions that most influence plant growth and development (Felfili et al. 1999). Among these, light is pointed as the factor that has the most influence on regeneration of forest-degraded areas, influencing mainly photomorphogenesis and photosynthetic biomass accumulation. Light is a critical

L. Endres (✉) · C. A. Câmara · V. M. Ferreira ·
J. V. Silva
Centro de Ciências Agrárias, Universidade Federal de
Alagoas, Av. Lourival Melo Mota, s/n, Tabuleiro do
Martins, Maceió, AL 57072-970, Brazil
e-mail: lauricioendres@hotmail.com; endres@pq.cnpq.br