

Chalermporn Thenwong 2006: Some Ecophysiological Characteristics of Four Bamboo Species at Trat Agroforestry Research Station, Trat Province. Master of Science (Forestry), Major Field: Silviculture, Department of Silviculture. Thesis Advisor: Assistant Professor Ladawan Puangchit, D.Sc. 67 pages.
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This study was conducted on ecophysiological characteristics of *Dendrocalamus asper*, *Thyrsostachys oliveri*, *Dendrocalamus latiflorus* and *Bambusa oldhamii* to determine gas exchange diurnal variation and the relationships with environmental factors. The study was carried out at the bamboo species trial at Trat Agroforestry Research Station, Trat province. Diurnal variation of photosynthetic rate (Pn), transpiration rate (E), water use efficiency (WUE) and stomatal conductance (Gs) of bamboo leaves were measured in the dry period (December, January and February) and the wet period (September, October and November). The measured environmental factors included light intensity (Q), leaf temperature (T) and sub-stomatal CO₂ (Ci). Differences in leaf chlorophyll content of the four bamboo species were also analyzed.

The results showed that the four bamboo species have similar patterns of Pn and E. The highest rates were found in the morning between 07:00 - 10:00 a.m. and decreased gradually after that. The rate continued to decrease or increase a little in the late afternoon in both dry and wet periods. The photosynthesis per day of the four bamboo species in the dry period were not significantly different among species, and ranged between 0.25 - 0.37 mol.m⁻².day⁻¹. In the wet period, the rates were significantly different, ranging between 0.41 - 0.55 mol.m⁻².day⁻¹. The pattern of transpiration rate per day between seasons was reversed compared to photosynthesis. The transpiration rate per day ranged between 0.08 - 0.13 kmol.m⁻².day⁻¹ in the dry period and 0.13 - 0.18 kmol.m⁻².day⁻¹ in the wet period. The diurnal variation of WUE and Gs differed among the four bamboo species, but the patterns were similar. The relationship between Pn and environmental factors including Q, T and Ci were highly significant in dry and wet periods. The responses of Pn and Q of four bamboo species were different. The maximum Pn ranged between 10.5 - 14.8 μmol. m⁻². s⁻¹ and *Bambusa oldhamii* showed the highest Pn. Light saturation point of the four bamboo species ranged between 960 - 1390 μmol. m⁻². s⁻¹ and the quantum yield ranged between 0.04 - 0.06.

The leaf chlorophyll contents varied among the four bamboo species. Chlorophyll b and total chlorophyll in leaves differed significantly among species but not chlorophyll a. The relationships between SPAD reading and leaf chlorophyll content of all bamboo species were similar. All the highly significant relationships showed linear functions.

Student's signature

Thesis Advisor's signature

