

Narakorn Srilert 2011: Some Physiological Characteristics and Carbon Sequestration of Four Eucalypt Clones. Master of Science (Forestry), Major Field: Silviculture, Department of Silviculture. Thesis Advisor: Mrs. Sapit Diloksumpun, Ph.D. 82 pages.

This study was undertaken in two experiments. The first experiment on eucalypt seedlings was carried out under nursery condition. A 4 x 2 factorial design in a randomized complete block design (RCBD) with two factors—namely, four clones of eucalypt (K7, K51, K59 and K7) and two light intensities (30 and 100%)—was applied with three replications. Growth, biomass, and leaf physiological characteristics were undertaken six months after the experiment. The second experiment was undertaken on four eucalypt clones planted on paddy bunds in two experimental trials in Chachoengsao province. An RCBD was applied with four replications to determine leaf physiological characteristics and to estimate the tree biomass and carbon storage of 1- to 3-year-old eucalypts.

The results show that the seeding diameter and height as well as the biomass of various parts were significantly influenced by light intensities, while only the height and leaf and root biomass were significantly different among clones. The light intensities also significantly affected leaf photosynthesis and chlorophyll content. The findings suggest that the clone K7 tended to be more shade tolerant compared with the others. The results on four eucalypt clones planted on paddy bunds showed significant differences in stomatal conductance, transpiration and intrinsic water-use efficiency, but not light-saturated net photosynthesis, among clones and between seasons. The clone K51 had relatively high light-saturated net photosynthesis in both wet and dry seasons, while the clone K58 had lower light-saturated net photosynthesis in the wet seasons with minimal changes in the dry season. However, the clone K58 had greater biomass in various parts and the above-ground biomass as well as the carbon storage compared with the others. The findings also suggest that the variation in the carbon storage of these eucalypt clones was contributed to intrinsic water-use efficiency determined in the wet season and the leaf area index.

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