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Evaluation of Growth Performance of Agarwood Producing Species under Three Shade Settings in Different Rubber Intercropping Systems

Dilrukshi P.G.T.<sup>1</sup>, Subasinghe S.M.C.U.P.<sup>1\*</sup>, Nayanakantha N.M.C.<sup>2</sup>,  
Senevirathna A.M.W.K.<sup>3</sup>

<sup>1</sup>Centre for Forestry and Environment, Department of Forestry and Environmental Science,  
University of Sri Jayewardenepura, Nugegoda, Sri Lanka

<sup>2</sup>Department of Plant Science, Rubber Research Institute, Agalawatte, Sri Lanka

<sup>3</sup>Department of Export Agriculture, University of Uva Wellassa, Sri Lanka

\*upuls@sjp.ac.lk

Abstract

Agarwood is a highly valuable resin mainly used as incense and perfume manufacturing and therefore a considerable foreign income can be obtained by the exports. Rubber, one of the main foreign income generating crops in Sri Lanka faces a severe threat due to low demand at the international market. Therefore growers are seeking for suitable short rotation species to intercrop with rubber. Along with that, the present study investigates the potential of intercropping three agarwood producing species; *Aquilaria crassna*, *A. subintegra* and *Gyrinops walla* of family Thymalaeaceae with RRIC 121 rubber clone under full sun, 50% and 30% shades. Those settings were made in two different planting systems, viz., double row (three agarwood lines between two rubber rows at 18 m distance) and single row (one agarwood line between two rubber row at 12 m distance) in 2 ha land of Rubber Research Institute, Agalawatte. *G. walla* is native to Sri Lanka and two *Aquilaria* species were introduced from Vietnam and Thailand respectively. Due to the fast growth rate, 50% and 30% shade settings were not applied for both *Aquilaria* species. Total tree height and stem diameter (above 30 cm of the ground) were collected from all (167) agarwood producing species in all two systems at monthly intervals. Data were statistically analysed after three years by one-way ANOVA using Minitab software. According to the results, both *Aquilaria* species grown in all systems recorded significant height and diameter growth than *G. walla*. There was no significant height or diameter growth difference between two *Aquilaria* species under full sun in both double row and single row systems. There was also no significant height or diameter growth difference between *G. walla* under all shades setting in all systems. Therefore the study revealed that the growth potential of *G. walla* is noticeably lower than selected *Aquilaria* species when intercropped with rubber.

**Keywords:** Agarwood producing species, *Gyrinops walla*, Rubber, Intercropping systems, Shade settings