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Growth Comparison of Young Three Agarwood Producing Species Intercropped with Rubber under Different Light Conditions

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Abstract

Sri Lankan rubber industry is facing severe challenges due to the presence of relatively cheaper synthetic rubber, poor quality lands, high labour cost and white root disease epidemic. Rubber Research Institute of Sri Lanka (RRISL) has found intercropping of short rotation commercial crops with rubber as a solution for these problems. Agarwood producing species of family Thymalaeaceae are suitable crops for this reason as those can be rotated about three times in a 30 year lifespan of a rubber plantation. Those species form a highly valuable resin due to a self-defense mechanism which can be induced artificially inside the stem. Therefore the present study was conducted to identify the most suitable agarwood producing species to be intercropped with rubber under different light conditions.

A field trial was established in RRISL premises of Dartonfield, Agalawatte for this reason. Three agarwood producing species; *Aquilaria crassna*, *A. subintegra* and *Gyrinops walla* were intercropped with rubber clone RRIC 121 planted in single and double row systems. The first two have recently been introduced to Sri Lanka and *G. walla* is native to the country. Agarwood species planted at 3m intervals in these intercropping systems were exposed to full sunlight and 50% artificial shade. Stem diameter at 30 cm above the ground and total height were taken as the growth measurements at monthly intervals for 15 months. Growth at the end of each three month period was compared using one-way ANOVA using Minitab software.

According to the results, both diameter and height were not significantly different for all three species when grown in 50% shade or under full sun. However, both diameter and height growth of *Gyrinops walla* was significantly lower than *A. crassna* and *A. subintegra* when grown under full sun and 50% shade in both single and double row systems of rubber at the 14th month. Apart from the height growth at the 14th month under full sun of double row system, significant differences were not observed for both diameter and height between *A. crassna* and *A. subintegra* for all above treatments. Therefore it is evident that the growth of *G. walla* which is native to Sri Lanka is lower even at the early stage than the introduced two agarwood producing species.

Keywords: *Gyrinops walla*, Agarwood producing species, Intercropping, Rubber