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Intercropping Agarwood Producing Species with Rubber for Sustaining Income

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Abstract

Sri Lankan rubber industry contributes to country's economy in significant manner. Anyhow the natural rubber industry has now faced a threat due to the low price. As a solution, financially profitable other species can be intercropped with rubber to maintain sustainable income of the growers. Since agarwood has a very high demand and value in perfume and incense industry, it is worth to assess the feasibility of growing this crop with rubber. Therefore, the current study was conducted for the first time to test the potential of growing three agarwood producing species with young rubber under two intercropping systems, of which rubber is grown as a single row with 12 m and double row with 18 m spacing. The field trial was established using *Aquilaria crassna*, *A. subintegra* and the native species *Gyrinops walla* of family Thymalaeaceae in 2 ha land belongs Rubber Research Institute, Agalawatte in low country wet zone. *A. crassna* and *A. subintegra* seeds were imported from Vietnam and Thailand respectively while *G. walla* seeds were locally collected. All seeds were germinated in a nursery to raise seedlings. Then, one and three rows of agarwood species were planted at 3 m distance between rubber in single and double row systems, respectively. Tree height and stem diameter (30 cm above the ground) were measured at monthly intervals for all agarwood species (152 trees) while those of rubber (174 trees) were measured at six months and two months intervals respectively. Data collected for 4 years were analysed by one-way ANOVA and Student's t-test. According to the results, *G. walla* recorded significantly lower height ($F=168.58$; $p=0.000$) and diameter ($F=77.49$; $p=0.000$) compared to both *Aquilaria* species in two selected intercropping systems. However, neither its height nor diameter was significantly different between two planting systems of rubber. Only *A. subintegra* in double row system was significantly taller than *A. subintegra* in single row and *A. crassna* in double row. Further diameter was not significantly different between *Aquilaria* species or planting system. However, the highest average tree height and stem diameter were recorded by *A. subintegra* in double row system and *A. crassna* in single row system respectively. Though diameter of rubber plants was not significantly different in two intercropping systems ($t=-1.73$; $p=0.085$), height in single row system was significantly taller ($t=-3.71$; $p=0.000$). The findings concluded that the growth performance of *G. walla*, the native species is comparatively lower than that of both *Aquilaria* species. Further, *A. crassna* and *A. subintegra* showed better height growth performances in single row and double row systems respectively.

Keywords: Agarwood rubber intercropping, *Aquilaria* species, *Gyrinops walla*, Single row, Double row system