Growth and Yield Performance of Selected Vegetables in *Gliricidia*-based Alley Cropping System

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The Gliricidia [*Gliricidia sepium* (Jacq.) Walp] is used as a hedgerow tree species in alley cropping system. However, studies on the impacts of Gliricidia on alley crops were limited to the dry zone of Sri Lanka. This experiment was conducted at alley cropping units of Department of Agronomy, Faculty of Agriculture, University of Jaffna, located in dry zone of Sri Lanka to assess the effect of gliricidia hedgerows on growth and yield performance of Tomato (*Solanum lycopersicon* L.), Radish (*Raphanus sativus* L.), and Water spinach (*Ipomea aquatic* F.). Three treatments; (i) 5 m spaced hedgerows, (ii) 10 m spaced hedgerows, and (iii) no hedgerows as a control, were laidout in a Randomized Complete Block Design (RCBD) with 3 replicates. Growth and yield parameters were measured and expressed in two ways; (1) per plot and (2) distance from a hedgerow. Light intensity was measured thrice a day. ANOVA with Duncan multiple range test was done at α 0.05 using SAS 9.1 package. Results revealed that the average yield of Tomato (1.29±0.22 t/ha) and Radish (7.15±1.85 t/ha) was significantly high in 10m alley. The average yield of Water spinach was significantly high in control (9.07±1.42 t/ha). The average yield of all crops was significantly low in 5 m alley. Light intensity was greater in control by 35.14 % and 88.78 % compared to 10 m alley and 5m alley, respectively. Yield with hedge row distance showed that significantly high yield was recorded in the middle of alley (Tomato: 0.27±0.12 kg/plant, Radish: 0.561±0.28 kg/plant, Water spinach: 0.66±0.28 kg/plant) than closer to the hedgerow. Light intensity was greater (22.72 %) in middle of the alley than closer distance to the hedgerows. Plant height of tomato was significantly high in 5 m alley, but number of fruits and leaves was significantly high in 10 m alley. For Water spinach, number of suckers and leaves was significantly high in the control. For Radish, root length and circumference were significantly high in 10 m alley. The average yield was low compared to recommended yield however, crop performance was comparable with alley cropping system. From this study, 10 m alley can be recommended for Tomato and Radish for better yield whereas Water spinach can be cultivated without hedgerows.

Keywords: Alley cropping, Alley width, Dry zone, Hedgerows, Vegetables