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Effect of land suitability classes (LSC) on growth and development of above ground and below ground components of coconut (*Cocos nucifera* L.) seedlings

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Effect of land suitability classes (LSC) on growth and development of above ground and below ground parts of coconut (*Cocos nucifera* L.) seedlings grown in LSC S2 (lands that have minor limitation to coconut cultivation), S3 (Lands that have some limitations to sustained coconut cultivation) and S4 (lands that have limitations to sustained coconut cultivation) in Bandiruppuwa Estate, Lunuwila was evaluated. The effect of LSC on physiological performances of the shoots was also investigated. Six months after establishment of seedlings physiological data collections were started. One year after planting, the first set of seedlings was harvested from each LSC to investigate the root growth performances.

Nine months after establishment, rate of transpiration (*E*) and stomatal diffusive resistant (SDR) of seedlings grown in S2 were significantly difference ($p<0.0001$) from S3 and S4. Photosynthesis (*A)* and leaf water potential (ψ_{leaf}) of seedlings grown in three suitability classes were not affected by LSC at this stage. However, seedlings grown under S2 showed 12% higher rate of *A* than the other two suitability classes.

Seedlings grown under S2, S3 and S4 did not show significant difference ($p<0.05$) in number of 1^{ry}, 2^{ry} and 3^{ry} roots at one year after field planting. The highest total root fresh weight and the lowest dry weight of total roots were observed in seedlings grown in S2 soils implying that the water content of these roots were higher than those of other two suitability classes. The primary root fresh weight and the 1^{ry} root volume in S2 seedlings were significantly higher ($p<0.001$) than those of S3 and S4. Total root length and volume were significantly difference ($p<0.01$) between S2 and S4 suitability classes. The highest total root length and volume were observed in S2 soils and the lowest was observed in S4. This indicated that there was a restriction for root growth and development created by the physical properties of LSC. Though no significant differences were found in leaf area development, the highest and the lowest figures were recorded in the seedlings under S2 and S4 respectively. It can be concluded that, though one year old seedlings did not show significant differences in all physiological performances, root system and the leaf area development were slightly affected by LSC. The significant effect of LSC did not observe at this stage may be due to the provision of a better environment for root growth in 3' x 3' whole buried with coconut husk. At uprooting it was found about two third of roots of one year old seedlings was in the planting whole and only the rest was observed beyond that.

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