ABSTRACT

THE COMPARATIVE EFFECTS OF SHADE AND MOISTURE ON THE GROWTH OF TRANSPLANTED COCOA SEEDLINGS (*Theobroma cacao* L. var. Amelonado)

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In this study, 9 months old amelonado cocoa seedlings were tested under three shade levels, three moisture levels and two transplanting techniques bare-rooted vs. covered root transplanting.

Bare-rooted seedlings, kept in a cool damp place overnight, could be successfully transplanted 13 to 14 hours later under both 50% and 25% light regimes. However, both covered root and bare-rooted seedlings transplanted into full sunlight died within two months in the case of the former and six weeks in the case of the later, in open sunlight.

Growth parameters such as height, girth, leaf number, specific leaf area, leaf weight ratio, average leaf size, total dry matter accumulation and root/shoot ratio were measured.

These parameters of growth were greatest in the 50% light regime with the highest water level and in the 25% light regime, with the intermediate water level. Generally, root/shoot ratio decreased with increasing water in the 50% and 25% light regimes. The growth of covered root plants was also higher than that of bare rooted plants.

The RGRs and NARs decreased with time and this reduction was more marked with the well watered plants than with the least watered plants. LAR increased with time and watering treatments indicating a strong morphological adaptation on the part of the plants to the varying growth conditions.

Photosynthesis rates, stomatal resistance and leaf water potential were not affected by the method of transplanting but rather by the light and watering treatments. The study showed that photosynthesis rate was highest when growth conditions were favourable for leaf expansion. In this study, the most favourable condition for leaf expansion of the seedlings was found to be 90% field capacity in the 50% light regime and 60% field capacity in the 25% light regime.