**426 D**

**Quantification of vegetative, reproductive and physiological parameters of rapid decline-affected coconut (Cocos nucifera L.) palms**

A substantial loss of crop is well evident due to Coconut rapid decline (CRD), which is a serious disorder of coconut palms (*Cocos nucifera* L.) in Sri Lanka. This study aims to measure vegetative, reproductive and physiological characters of CRD-affected palms quantitatively and to compare those characters with healthy palms.

Fifteen-years-old CRD–affected Coconut palms (var. Typica (Tall ×Tall) in Makandura Seed Garden (MSG) of Coconut Research Institute, Sri Lanka were used for the study. Apparently healthy (S0) and Initial- (S1), Moderate- (S2) and Severe- (S3) CRD-affected palms were used for the study. Nut and inflorescence characters, canopy and trunk characters, transpiration, stomatal diffusive resistance (SDR) and total chlorophyll content (TCC) of the palms were measured. Data were analyzed by ANOVA, using the GLM procedure of SAS.

There was a significant reduction in all the parameters in CRD-affected palms compared to healthy palms, except for SDR, weight, length and circumference of nuts. Total number of fronds in the canopy was significantly higher in healthy palms (31) than 'diseased' palms (S1: 20, S2: 20 and S3: 20). The trunk circumference at canopy level was 84.94 cm, 67.14 cm, 65.01 cm and 61.83 cm for S0, S1, S2 and S3 respectively. Number of nuts per bunch was significantly higher in healthy palms (8) than S1 (5), S2 (4) and S3 (2). The same pattern was observed for the total number of female flowers produced per bunch (S0: 35, S1: 13, S2: 10, S3: 7). Length of the unopened spadix length was 94.44 cm, 62.70 cm, 63.58 cm and 58.73 cm and circumference was 25.17 cm, 16.22 cm, 16.89 cm and 16.31cm for S0, S1, S2 and S3, respectively. There was no difference in the nut weight among S0, S1, S2 and S3, but the nut size was smaller in CRD-affected palms. Healthy palms showed the highest rate of transpiration (2.7 µg cm –2 s-1) and this were followed by S1 (2.11 µg cm –2 s-1), S2 (1.54 µg cm –2 s-1) and S3 (1.48 µg cm –2 s-1). This pattern was reversed for SDR. TCC was higher in healthy palms (3.13 mg/g fresh weight) compared to 'diseased' palms (2.70 mg/g fresh weight). These quantifications of CRD symptoms would be useful in formulating an index for grading the degree of disorder. Further, it implies the possibility of using water relation parameters, transpiration and SDR, for the diagnosis of the disease.