

TEMPERATURE AND RAINFALL VARIABILITY ON CARBOHYDRATE CONTENT OF ANTHERS AND POLLEN GERMINATION IN COCONUT (*Cocos nucifera* L.)

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Temperature and rainfall variability during and two months prior to flower opening affect the floral development and pollen germination in coconut. Hence, a study was conducted to determine the effect of temperature and rainfall on carbohydrate content of anthers and pollen germination in coconut. Concentrations of total soluble sugars (TSS) and starch of anthers and percentage pollen germination (PG%) at 28 °C and 34 °C were measured in seven coconut cultivars (TT, TSR, DGT, DBT, TDB, DGSR and DBSR) established at Panadura estate, Wanathawilluwa (DL₃) from January to April, 2014. Treatments were arranged as a factorial experiment in a Complete Randomized Design. Mean temperature and cumulative rainfall prevailed during and two months prior to flower opening in January were 30.8 ±0.09 °C and 296.9 mm, (favourable) while it was 32.7 ±2 °C and 68.2 mm (unfavourable) in March. A significant ($p < 0.05$) month x cultivar interaction was observed for starch concentrations. In February, starch concentration was highest for all cultivars and it has reduced by 87% from February to March. DBSR showed the highest starch concentration (147.3 mg/g) over the period. In January, starch concentration was highest in DGSR and lowest in DBT whereas in March it was highest in TSR and lowest in TDB. The highest TSS concentration was observed in January and March for all cultivars. Among cultivars, the highest mean TSS was observed in TT and DBSR over the period. Pollen germination was reduced in all cultivars with increasing temperature from 28 to 34 °C. The highest PG% was recorded for TT and DBSR in January and March respectively. PG% showed a significantly ($p < 0.05$) negative correlation with starch concentration and a positive correlation with TSS. Temperature and rainfall during and two months prior to flower opening showed variable effects on starch and TSS of anthers and PG% in coconut.

Keywords: Pollen germination, Rainfall, Starch content, Temperature, Total soluble sugars