

## **Effect of canopy thermal changes on pollen fertility and yield as influenced by time of planting and water stress imposed at reproductive phase of rice**

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### **ABSTRACT**

Drought and heat stress at flowering stage affect rice yield. Hence, it is very important to understand the thermal changes of rice canopy during drought and heat stress conditions. Thus, objective of this study was to assess the thermal changes inside the canopy and its impact on pollen fertility and yield. A split plot design with three replicates was used for the field experiments at Field Crops Research and Development Institute, *Mahailuppallama* in three *Yala* seasons from *Yala* 2014 to *Yala* 2016. Main factor was the planting time (early and late planting) which synchronizes flowering at different temperature regimes. Sub-plots were Bg 358 flooded, Bg 358 drought stress, Bg 366 flooded and Bg 366 drought stress. Data were collected on ambient temperature, relative humidity, canopy temperature, volumetric moisture content of soil, pollen fertility and grain yield. The lowest canopy temperature was observed in early planting flood treatments. Maintaining volumetric moisture content at 27.5% with a canopy temperature of 30 °C resulted in 90% pollen fertility. Peak canopy temperature and canopy temperature at flower opening was highly correlated with grain yield. Peak canopy temperature and canopy temperature at 10:00 am augmented the rice yield. The critical canopy temperature on yield was estimated as 34.0 °C. Maintenance of standing water at flowering stage is an important migratory option to avoid heat stress rice.

**Key words: Canopy temperature, Moisture stress, Planting time, Pollen fertility.**