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Analysis of weather impacts on oil palm productivity

Nuzhat Khan; Mohamad Anuar Kamaruddin; Usman Ullah Sheikh; Muhammad Paend Bakht; Mohd Norzali Haji Mohd; Ab Al-Hadi Ab Rahman

— Author & Article Information

b) Corresponding author: anuarkamaruddin@usm.my

[a] nuzhat_khan@student.usm.my

[c] usman@fke.utm.my

[d] paend@uthm.edu.my

[e] norzali@uthm.edu.my

[f] hadi@utm.my

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Oil palm is the major source of vegetable oil in the world and Indonesia and Malaysia are the main palm oil producing countries. Its fresh fruit bunch (FFB) yield refers to the quantity of fresh fruit bunches harvested from oil palm trees. There is limited knowledge on the factors accounting for variation in FFB yield. This study investigated relationships between weather factors with FFB yield and its components using data obtained from study site Pahang Malaysia. The database included weather variables and yield records for 35 years, portraying a wide range of yield and environmental conditions. We used average monthly and annual values to detect temporal variations in yield associated with weather based on average rainfall, maximum temperature, minimum rainfall and number of rainy days per month. It is found that water stress was the key factor accounting for temporal variation in oil palm yield. Our analysis also highlights the importance of frequent rainfall as a stress factor in oil palm, with this study being the first to demonstrate the negative relationship between yield and rainfall frequency. Meteorological anomalies during the drought period did not exhibit major impact on yield which indicated significance of

appropriate irrigation strategy. These findings extend current knowledge about sources of variation in oil palm yield, providing useful information to describe oil palm production in context of environment and improve oil palm production by mitigating negative weather impacts on yield. Moreover, it can facilitate oil palm modeling and timely forecasting.

Topics

Biofuels, **Hydrology**, **Knowledge**

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