

RESEARCH NEWS

**SUITABILITY OF RICE LAND IN RELATION TO TEMPERATURE  
AND RELATIVE HUMIDITY**

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Climatic conditions, especially temperature and relative humidity, within the country are varying due to differences in height from the mean sea level. Both higher maximum and higher minimum temperatures with high relative humidity decreases rice yields due to spikelet sterility (Peng *et al.*, 2004). High temperature also affects grain quality by reducing the head rice yields and the grain size. According to Nishiyama *et al.* (1969), the critical maximum temperature for rice is 35°C and the critical minimum temperature is 19°C. The relative humidity beyond 80 % is not favourable for rice production. Therefore, this study was carried out to categorize the rice fields in Sri Lanka on their suitability for rice cultivation considering temperature and relative humidity in both *yala* and *maha* seasons.

Climatic data (rainfall, maximum and minimum temperature, relative humidity) were collected from 30 meteorological stations representing major agro-ecological regions within the country and the mean values were calculated using weekly data of 5 years from 2003. The time taken for reproductive stage in rice was identified for each field station by fixing the harvesting dates with the amount and distribution pattern of rainfall. Temperature and relative humidity at the reproductive stage of rice plant was considered as the most important climatic parameters in rice physiology and development. The maximum temperature, minimum temperature and relative humidity for two cultivated seasons were calculated separately for 3 ½ month age rice varieties. Using Geographic Information System (GIS), thematic maps were prepared for the above parameters for both *yala* and *maha* seasons. The maximum temperature categorized into six classes (<19, 19-25, 25-30, 30-32, 32-35, >35 °C) and the minimum temperature categorized into two classes *viz.* less than 19°C and more than 19°C. The relative humidity was mapped under three categories namely, 60-70 %, 70-80 % and more than 80 %. These three maps were overlaid to prepare the climatic suitability map for rice cultivation. When the optimum values of each parameter coincided, those areas were categorized as Highly Suitable (HS), and when the critical values coincided, those areas were considered as Not Suitable (NS). Suitable (S) and Moderately Suitable (MS) categories were identified with the combined effect of three parameters.

Results showed that the rice growing areas in Sri Lanka experience more than 80 % relative humidity during the *maha* season. In the *yala* season, the relative humidity in the dry zone varies between 70 % and 80 % while wet and intermediate zones have relative humidity of above 80 %. In most parts of the maximum temperature varied between 30-35°C in the *yala* season and between 25-32°C in the *maha* season. The up country including the whole of Nuwara Eliya district and part of Badulla district showed a minimum temperature of less than 19°C which is critical for rice. As such, up country area was considered as unfavorable for rice cultivation. The land suitability map for rice revealed that 64 % area is moderately suitable and 28 % is suitable in the *yala* season. The MS area lies within the dry zone while S area lies in the intermediate and wet zones. In the *maha* season, 63 % of the area is suitable and 24 % is highly suitable for rice. The whole districts of Batticalao, Ampara, Polonnaruwa and part of Trincomalee, Matale, Kandy and Monaragala districts lie within the HS area.

#### REFERENCES

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