Variation of relative humidity and air temperature in rice
(oryza sativa L.) canopy

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ABSTRACT

A field experiment was conducted at Regional Agricultural Research
Station, Jagtial (18°50’ N, 78°56’ E; 248.4 m above MSL) during kharif, 2005
and rabi 2005-06 to study the micro climate variation, particularly relative
humidity and air temperature in rice crop canopy. Higher relative humidity
was recorded within crop canopy at flowering stage than at panicle initiation
and dough stage in both the seasons. During kharif higher relative humidity
was recorded compared to rabi season. Higher relative humidity and air
temperatures were recorded within crop canopy than above crop canopy.

Keywords: Rice, relative humidity and air temperature

In Andhra Pradesh, rice is being
cultivated in an area of 4 million ha, of which
95 per cent is under irrigation. To improve
production, it is imperative to understand the
weather both at macro and micro level as
weather directly influences the crop growth
and development. For higher productivity,
rice requires higher light intensity.
Temperature and relative humidity within
the crop canopy vary as the crop grows.
Atmospheric humidity influences the
internal water potential of plants and the
rate at which plants transpire water into
atmosphere (Hoffman, 1973). Most of
the rice is cultivated under irrigated
ecosystem. In this system, 2-5 cm depth of
water is maintained during the crop period
that changes the microclimate of the crop.
There is a need to know the microclimate
variations particularly relative humidity and
temperature in rice crop for optimum crop
production. Hence, the present investigation
was undertaken to study the relative
humidity and air temperature profiles in rice
crop during day time.

MATERIALS AND METHODS

A field experiment was carried out
during kharif, 2005 and rabi 2005-06 with
rice Cv. Jagtiala Sannalu by adopting 15cm
X 15cm spacing with a plot size of 12m X
9m at Regional Agricultural Research
Station, Jagtial, Andhra Pradesh. The co-
ordinates of the study site are 18°50’ N
latitude and 78°56’ E longitude with an
altitude of 248.4 m above MSL. The weekly
meteorological data pertaining to kharif,
2005 and Rabi, 2005-06 were presented in
Table 1 & 2. The kharif crop was sown on
Rabi crop was sown on 07.12.2005 and harvested on 04.05.2006. All the recommended cultural operations and protection measures were adopted.

The relative humidity and temperatures were measured within crop canopy (i.e., 10 cm height from ground level) and above crop canopy (i.e., 10 cm height from above crop canopy) using instrument ‘Kesretel Pocket W weather Tracker’ (Mfd. by Nielsen-Kellerman, USA) at fortnightly interval from 9.00 h to 16.00 h IST during both the seasons. The weather tracker gives instantaneous readings and three readings were recorded each time and averaged for interpretation.

RESULTS AND DISCUSSION

Temporal and seasonal variation in RH

The study revealed that, daytime relative humidity decreased gradually from 9.00 hrs to 15.00 hrs within crop canopy with slight increase of 2-4% by 16.00 h. Roy and Tripathi (2006) also observed similar results in wheat crop. Similar trend in relative humidity was also observed above crop canopy. Higher relative humidity (up to 8%) was recorded within crop canopy than above crop canopy during both the seasons. During kharif and rabi, higher relative humidity was recorded within crop canopy at flowering stage than at PI stage and dough stage (Table 3).

Higher relative humidity was recorded in kharif than in rabi crop. During kharif the relative humidity within crop canopy at 09.00 h ranged from 57-85% (Table 3) and in rabi it was 49 – 65% (Table 4). Whereas, the relative humidity above crop canopy in kharif was in the range of 50-82% and in rabi it was 46-60%. Higher variations were observed in a day during the kharif than in rabi.

The rice grain yield was higher during rabi season (5.30 t ha⁻¹) compared to kharif season (5.14 t ha⁻¹). This was due to the availability of relatively more number of sunshine hours during rabi season compared to kharif (Table 1 & 2).

Temporal and seasonal variation in air temperature

Sometimes sudden fall in air temperature was observed during the day time due to the passage of cloud while recording observations. Higher air temperature was recorded within crop canopy than above crop canopy and it was in the range of 0.1 to 2.0 °C.

Higher air temperature was recorded within and above crop canopy during early stages of the kharif crop and decreased with advance of the crop growth. Whereas, in rabi with the advance of crop growth higher air temperatures were recorded.

CONCLUSIONS

It can be concluded that, higher relative humidity was recorded within crop canopy at flowering stage than at panicle initiation and dough stage in both the seasons. During kharif higher relative
Table 1: Weekly meteorological data recorded at RARS, Jagtial during *kharif*, 2005

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Table 2: Weekly meteorological data recorded at RARS, Jagtial during Rabi, 2005-06

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**Table 3:** Day time variation in air temperature (°C) and relative humidity (%) in rice crop during *kharif*, 2005

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*Within crop canopy (10 cm height from ground level)*

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<th>Relative Humidity (%)</th>
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*Above crop canopy (10 cm height above crop canopy)*
### Table 4: Day time variation in air temperature (°C) and relative humidity (%) in rice crop during rabi, 2005-06

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humidity was found than in rabi season. Higher relative humidity and air temperatures were recorded within crop canopy than above crop canopy. The rice grain yields were higher during rabi compared to kharif season.

REFERENCES
