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AN ANALYSIS OF DEWFALL AT SELECTED STATIONS IN KERALA

Dewfall is referred to water condensed on surfaces of soil, plant and other objects from atmospheric water vapour due to radiational cooling during the night when the temperature falls below dewpoint but above freezing point (Rosenberg, 1974). Such dew deposited on leaf surfaces may be absorbed through centicle of normal epidermal cells or through specialized cells and directly utilized by plants (Slatyer and Mcllory, 1961; Daubenmire, 1974). The dew deposition on leaf surfaces also reduces the transpiration and water requirement of crops and wetting of leaves increases in photosynthetic rate during early hours in the morning (Slatyer and Mcllory, 1961).

Dewfall forms as one of the sources of moisture for crops in the humid tropical Kerala during October to March. Raman *et al.*, (1971) summarized the dewfall distribution over India which shows that the humid tropical Kerala receives 5-10 mm of dewfall per season. Further an analysis of dewfall has been attempted in this paper to know its amount, frequency and its possible contribution for evapotranspiration of vegetation in this area.

The dewfal! data at 5, 25, 50 and 100 cm heights recorded with Duvdevan dew gauge since 1979 at four Indian meteorological stations viz., Calicut, Ollukara Pattambi and Trivandrum and at Kottamparamba since 1981 have been taken for the present analysis. The soil samples in the 5 cm depth in an open field at Kottamparamba were collected at 600 1ST and the soil moisture was determined by gravimetric method. The observations on air and soil temperatures, humidity and windspeed were also collected and correlations were worked out between dewfall and weather parameters and between dewfall and soil moisture.

The amount and frequency of dewfall for 50 cm height recorded at 5 locations in the humid tropical Kerala are given in Table 1. The dew records at 50 cm was chosen because the dew deposition will ba maximum at that height. The dew fall in the region during October to March ranges from 4 to 14 mm per season. The dew deposition was lower at Calicut (height 5m above msl) than at Kottamparaba (height 80 m above msl). The frequency of dewfall was also lower at Calicut than at Kottamparamba. This shows that the weather conditions are favourable for maximum deposition of dewfall in the midlands of this region where the density of plantations is also upto 85% of the cropped area.

Due to increase in elevation, the night air temperature (October-March) drops down by 2-3°C from Calicut to Kottaparamba. Significant variations are not observed in humidity from Calicut to Kottaparamba during dewy nights. Though humidity is high in the coastal regions as observed at Calicut, the air temperature moderation by the Arabian sea causes higher night air temperatures which will cause lower dew deposition at Calicut. The windspeeds are also higher at Calicut than at Kottamparamba which will also lower the dew deposition at Calicut.

Table 1

Dewfall (mm) and its frequency in the humid tropica! Kerala

Station	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total per season
Trivandrum	1.6	1.9	1.4	0.7	1,2	1.0	7.8
(08°28'N,76°57'E, 8m)	15	17	14	15	17	15	93
Ollukara	1.5	3.1	0.6	0.7	0.9	1.0	8.0
(10°32'N, 76°16'E, 22m)	13	17	5	8	14	15	82
Pattambi	1.8	3.6	0.5	0.3	0.9	1.1	8.2
(10°48'N, 76°12'E, 25m)	13	19	10	11	13	19	85
Calicut	0.8	0.8	0.6	0.7	0.5	0.5	3.9
(11°15'N, 75°47'E, 5m)	20	19	20	25	15	19	118
Kottamparamba	1.0	3.7	3.1	2.7	2,1	1.4	14.0
(11°15'N, 70°52'E, 80m)	10	20	30	30	20	15	125

The correlation coefficients of dewfall at Kottamparamba with night time humidity, minimum temperatures and windspeeds were statisticaliy non-significant. The prediction equations of dewfall (dependent variable) in relation to nighttime, relative humidity and minimum temperatures (independent variable) were also statistically non-significant (at 0.05%). During dewy nights, the temperatures at Kottamparamba were between 19–25°C and relative humidity was 98% or above. The winds were below 1 km/h.

The dewfall at Kottamparamba gave a correlation coefficient of 0.304 (non-significant at 0.05 level) with the soil moisture content in the surface 5 cm soil layer in an open field at 1600 IST. This shows that the dewfall can account for 9 per cent of the variations in surface soil moisture.

The amount of dewfall deposition in the region shows that the dewfall can meet for about 5-10% of the evaporative demand as shown by a class A pan evaporimeter. The pan evaporation rates in the region ranges from 3-5 mm per day during October-March. Also, it may be noted down that the dewfall recorded inthe early hours with Duvdevani dew gauge is the net dewfall after meeting the night evaporative demand.

The dewfall at 50 cm height is about 25-50 per cent more than the amount at 5 cm which shows that the deposition may be high at greater heights. Also the amount of dewfall available to these plantation crops will be much higher if the cumulative dew deposition in different canopy leaf layers of crops is considered.

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സംഗ്രഹം

ആർദ്രോഷ്ണമേഖലാ പ്രദേശമായ കേരളത്തിൽ ഒക്ടോബർ മുതൽ മാർച്ച് മാസം വരെയുള്ള കാലയളവിൽ പതിക്കുന്ന മഞ്ഞ്, ജല ലഭ്യതയുടെ ഒരു പ്രധാന ഉറവിടമാണ്. ഭൂപ്രകൃതിക്കനുസരിച്ച് പ്രസ്തുത പ്രദേശത്ത് പതിക്കുന്ന മഞ്ഞിന്റെ അളവ് 4 മി. മീ. മുതൽ 14 മി. മീ. വരെയാണെന്ന് കണ്ടിട്ടുണ്ട്. ഉയരം കൂടുന്നതിനനുസരിച്ച് മഞ്ഞിന്റെ അളവിൽ വർദ്ധനവുണ്ടാകുന്നു. മേൽമണ്ണിലെ ഈർപ്പം വർദ്ധിപ്പിക്കാനും മണ്ണിന് സാധിക്കുന്നു.

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Fig. 1 Abnormal branching of inflorescence in banana var. Palayamkodan

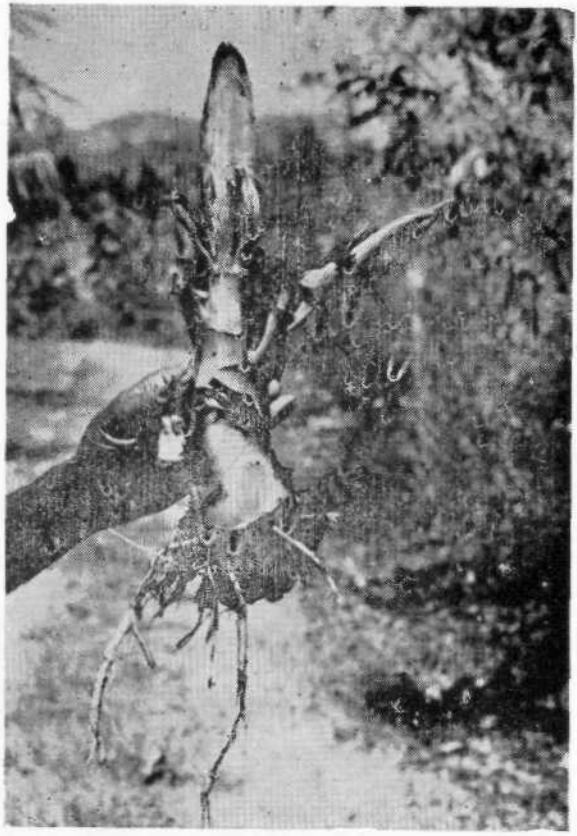

Fig. 2 Inflorescence branching showing two well developed branches with prominent male buds