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Impact of micro-meteorological parameters on growth and productivity of mung bean under different agro-forestry systems in arid Rajasthan

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ABSTRACT

Micro-weather investigations (air temperature, relative humidity profiles, thermal time, energy balance and light interception) were carried out in rainfed mung bean (*Vigna radiata* cv. S8) sown as sole crop as well as intercrop with *Ber (Zizyphus mauritiana)*, *Khejri* (Prosopis cineraria) and Babul (*Acacia nilotica*) during three *Kharif* seasons (1996-99) in Jodhpur. Micro-climatic modifications by the different agro-forestry systems during various crop growth stages are compared with open field. Air temperature inside the agrihorticulture system (*ber* + mung bean) and sole crop were lower by 1.6 to 2.8 °C and 1.4 to 2.6 °C, respectively, than the open field. Grain yield of mung bean intercrop with ber was 5 to 20% higher in comparison to sole crop depending upon rainfall and drought conditions in the arid region.

Key words: Micro-climatic modification, Drought, Mungbean, Intercrops, ber,

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Annual and seasonal climatic variability at different locations of Punjab state

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ABSTRACT

Annual and seasonal variabilities in maximum, minimum temperature and rainfall were analyzed from historical daily meteorological data for Amritsar (1970-98), Patiala (1970-98), Ludhiana (1970-99) and Bathinda (1977-98). Two distinct crop growth seasons of *kharif* (1 May to 31 October) and *rabi* (1 November to 30 April) were characterized for seasonal trends. Both annual as well as seasonal maximum and minimum temperatures exhibited small standard deviation and coefficient of variation at all stations indicating minor variations in temperatures. The maximum temperature had remained near normal for all the locations while showing a variation of upto ± 0.6°C from normal as revealed from the five yearly moving average. However, the minimum temperature had generally increased by as much as 0.4 to 1.6°C above normal. The annual as well as seasonal rainfall exhibited high standard deviation and coefficient of variation indicating large variations in rainfall at all stations. The five yearly moving average trend in rainfall showed an overall increase of about 120 mm at Amritsar, 150mm at Ludhiana, 150mm at Patiala and 140mm at Bathinda.

Key Words : Climatic variability, Trends.

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Assessment of irrigation and drainage requirement based on rainfall analysis for Bara Tract of Gujarat

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ABSTRACT

Rainfall analysis for the period 1901-1990 was carried out for determining onset of effective monsoon, rainfall depth-duration relationship, irrigation and drainage requirement. Water requirement and irrigation scheduling of cotton and pigeonpea based on the CROPWAT model revealed that under un-irrigated condition, in an average rainfall year, 80 % of the potential yield can be achieved in both the crops. On the basis of rainfall, design parameters for the rainwater harvesting structure for the region was also developed.

Key Words : Rainfall analysis, CROPWAT model, Water harvesting structure.

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Prediction of extreme rainfall events for mid central table zone of Orissa

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ABSTRACT

For designing and planning of soil conservation structures on watershed basis, knowledge of maximum one day rainfall is very useful. Thirty one years rainfall data of two stations of mid central table land zone of Orissa viz., Dhenkanal and Kamakhyanagar were collected and one day maximum rainfall was predicted using 4 different probability distribution functions viz., Normal, Log normal, Log Pearson and Extreme value type-1. Study reveals that for both the stations, Extreme value type-1 distribution was the best fit probability distribution function for predicting maximum one-day rainfall in a year. Using this distribution, frequency of 2, 3, 4, 5 and 10-days rainfall extremes were computed.

Key words: Probability, Normal, Log normal, Log Pearson, Extreme value type-1

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Estimation of PET by various methods and its relationship with mesh covered pan evaporation at Ludhiana

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ABSTRACT

Mesh covered pan evaporation at Ludhiana was correlated with potential evapotranspiration (PET) computed by using empirical methods of Thornthwaite (1948), Papadakis (1965), Jenson and Haise (1963) and Modified Jenson and Haise (1975). Weather data for 30 years period from 1970 to 1999 for Ludhiana was used to work out PET by various methods. Linear regression equations were fitted between monthly PET by each method and the measured pan evaporation. Pan evaporation correlated well with monthly PET having R^2 value of 0.84 for Papadakis method, 0.79 each for Jenson & Haise and for Modified Jenson & Haise method, and 0.65 for Thornthwaite method.

Key words : Potential evapotranspiration, Pan evaporation, Empirical methods

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Weather relations of rice blast in mid hills of Himachal Pradesh

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ABSTRACT

Weather and disease data of mid hills of Himachal Pradesh for three seasons 1997, 1998 and 1999 have been used for the study. The disease incidence invariably occurred at the tillering stages in all the three seasons. Correlation and regression analysis indicated that the lower minimum temperature was found associated with the blast disease of rice.

Key words: Rice blast, Minimum temperature, Cloud cover, Weather parameters.

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Study on the weather relationship of eriophyid mite in coconut

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ABSTRACT

Field study was undertaken during March 2000 to August 2000 at Coconut Nursery garden of Tamil Nadu Agricultural University, Coimbatore, to understand the relationship between weather and nuts affected with eriophyid mite in coconut. The maximum temperature had negative correlation with nuts affected in all the varieties [Tall (east coast), Dwarf (yellow), Tall X Dwarf, Orange, Dwarf X Tall] at three months after spathe emergence; where as positive correlation was obtained for maximum temperature one to two months before spathe emergence in respect of Tall (east coast) and Dwarf x Tall varieties. In general eriophyid mite affected nuts were either positively or negatively influenced by minimum temperature and relative humidity (0722 IST and 1422 IST). From the stepwise regression analysis made, one to two months earlier or one to two months after spathe emergence, wind speed had higher influence on the nuts affected with mite irrespective of varieties except in Tall x Dwarf treatment.

Key words: Coconut, Weather, Eriophyid mite

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Effect of temperature on phenology of groundnut (*Arachis hypogaea* L.) during *rabi* season

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ABSTRACT

Field investigation was carried out to study the effect of temperature on phenology of groundnut during rabi season. Results revealed that the rate of emergence was highest at mean temperature of 23.9°C and lowest at 19.9°C. Increase in mean temperature significantly increased the emergence rate (r = 0.6708**) of groundnut seedlings. Number of days taken to 50 per cent flowering was less at higher mean temperatures. Rate of flowering significantly increased with increase in mean temperature (r = 0.9592**). Low minimum temperature during pod filling phase extended the duration of November sown crop.

Key words: Groundnut, Phenology, Temperature