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AGRON-221

Introductory Agro meteorology & Climate Change

2(1+1)

Theory

Meaning and scope of agricultural meteorology; Earth atmosphere- its composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze; Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, longwave and thermal radiation, net radiation, albedo; Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; Artificial rainmaking. Monsoon- mechanism and importance in Indian agriculture, Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave. Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production. Weather forecasting- types of weather forecast and their uses. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

Practical

Visit of Agro meteorological Observatory, site selection of observatory, exposure of instruments and weather data recording. Measurement of total, shortwave and longwave radiation, and its estimation using Planck's intensity law. Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS. Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis. Measurement of soil temperature and computation of soil heat flux. Determination of vapor pressure and relative humidity. Determination of dew point temperature. Measurement of atmospheric pressure and analysis of atmospheric conditions. Measurement of wind speed and wind direction, preparation of wind rose. Measurement, tabulation and analysis of rain. Measurement of open pan evaporation and evapotranspiration. Computation of PET and AET

Lecture schedule: Theory

S.N.	Topic	No. of lectures
1.	Meaning and scope of agricultural meteorology	1
2.	Earth's atmosphere- its composition, extent and structure	1

3.	Atmospheric weather variables; Atmospheric pressure, its variation with height	1
4.	Wind, types of wind, daily and seasonal variation of wind speed	1
5.	Cyclone, anticyclone, land breeze and sea breeze	1
6.	Nature and properties of solar radiation, solar constant, depletion of solar radiation	1
7.	Short wave, long wave and thermal radiation, net radiation, albedo	1
8.	Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature,	1
9.	Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure,	1
10.	Process of condensation, formation of dew, fog, mist, frost, cloud	1
11.	Precipitation- process , types such as rain, snow, sleet, and hail	1
12.	Cloud formation and classification; Artificial rainmaking, Monsoon-mechanism and importance in Indian agriculture	1
13.	Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave	1
14.	Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production	1
15.	Weather forecasting- types of weather forecast and their uses	1
16.	Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.	1

Lecture schedule: Practical

S.N.	Topic	No. of lectures
1	Visit of Agrometeorological Observatory, site selection of observatory, exposure of instruments and weather data recording.	2
2	Measurement of total, shortwave and long wave radiation, and its estimation using Planck's intensity law.	2
3	Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS.	2
4	Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis.	1
5	Measurement of soil temperature and computation of soil heat flux.	1
6	Determination of vapor pressure and relative humidity.	1
7	Determination of dew point temperature.	1
8	Measurement of atmospheric pressure and analysis of atmospheric conditions.	1
9	Measurement of wind speed and wind direction, preparation of wind rose.	1
10	Measurement, tabulation and analysis of rain.	1
11	Measurement of open pan evaporation and evapotranspiration.	1
12	Computation of PET and AET.	2

References:

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2. Lal, D.S. 2005 Climatology, Sharda Pustak Bhawan, Allahabad..
3. Varshneya, M.C. and Balakrishna, Pillai, 2003. Text book of Agricultural Meteorology. ICAR, New-Delhi.
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5. Murithy, K, and Radha, V. 1995. Practical Manual on Agricultural Meteorology , Kalyani Publishers, New-Delhi
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