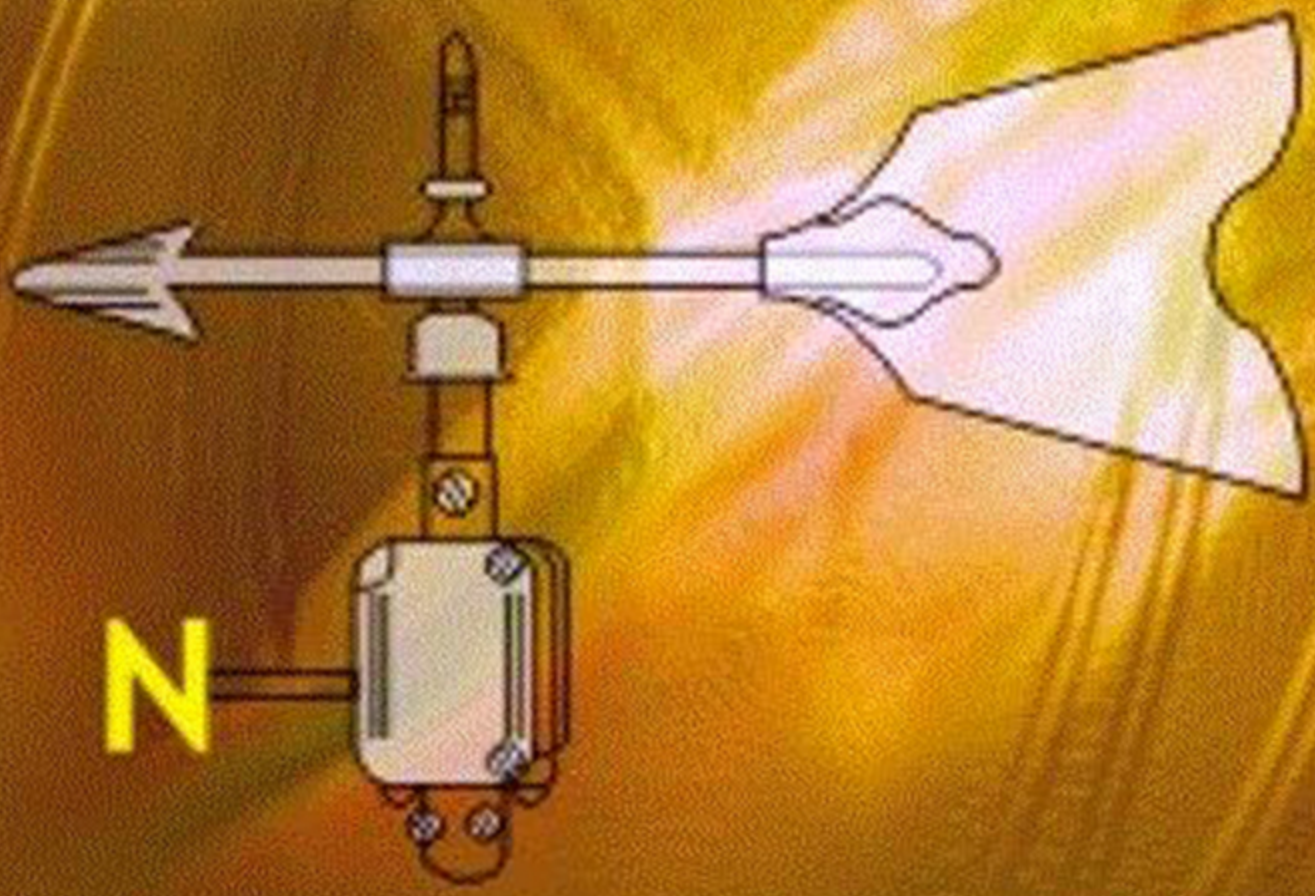
MANUAL ON PRACTICAL AGRICULTURAL METEOROLOGY



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PREFACE

Agriculture and weather are the integral components of Crop production system. Successful crop production depends on the prevailing weather conditions at different stages of crop growth. Understanding of the complexity of weather conditions needs the precise measurement of various weather elements for proper interpretation in relation to crop growth and development. The process of measurement involves elaborate arrangements for the establishment of Agrometeorological observatory with various weather instruments as per IMD specifications. Further, timely recording, calculation and the use of this data for forecasting or for the preparation of crop weather bulletins needs thorough knowledge of the science of Agrometeorology.

In the recent past there has been revision and reorientation of the syllabus for undergraduates in Agriculture, Horticulture, Forestry and allied subjects. Further external evaluation component has been included in the examination system. In this context there has been a felt need to develop text books for theory and practical manual for practical as per the syllabus to equip the students and also as a reference material for the course teachers. We hope this book would be useful to the students and all those who are involved in the measurement of weather data. We invite the constructive suggestions for its improvement.

We express our gratitude to Dr. M. N. Sheelavanthara, the Hon'ble Vice Chancellor, UAS, Bangalore, Dr. P. G. Chengappa, Former Director of Instructions (Agri), College of Agriculture, UAS, GKVK, Bangalore for their

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CHAPTER 1

INTRODUCTION

Most of the biological systems in nature, including micro-organisms, animals, vegetation, human beings etc are depending for their growth and development on the environment to which they are exposed. In most of crop plant in particular, the natural environment of soils and the surrounding atmosphere play a major role. The root parts of the crops are continuously in contact with the soil (rhizosphere). Therefore, the physical, chemical and biological properties of the soils, as well as, its solid, liquid and gaseous phases influence the plants in different ways and they can be managed suitably for better crop performance. Further, the aerial parts of the plants that are above the soil surface are exposed to the surrounding atmosphere. The state of this part of the atmosphere during different phases of crop growth has got profound influence on the crop. To understand this interaction, it is necessary to study the part of the atmosphere to which the plants are exposed.

The state of the atmosphere can be felt, but can not be described or quantified as such in terms of a single factor since the atmospheric condition at any place and time is due to interaction of different parameters. Hence, the state of the atmosphere at any instant can be described by a number of measurable parameters called atmospheric elements/ weather elements/ meteorological elements/climatic factors. The study of these parameters individually and their interaction is the formation of suitable environment for plant growth constituents the subject of Agricultural meteorology.

To measure and study these variables and the formation of suitable environment for crops, a suitable location is needed. It is called the observatory. The place needed to study the environment for the purpose of crop is called the weather observatory.

CHAPTER 2

CROP WEATHER OBSERVATORY

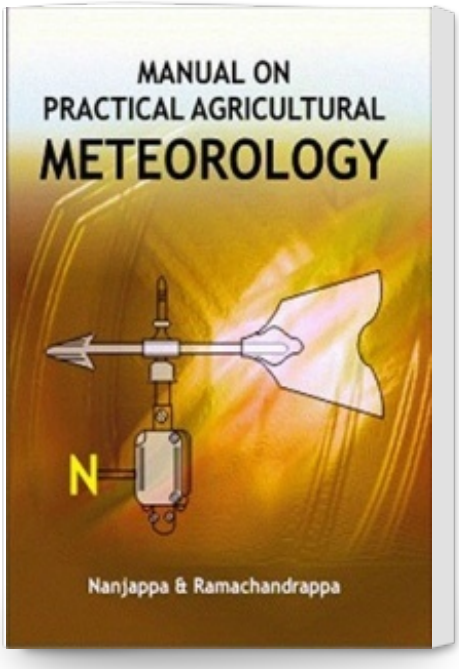
In general an observatory, similar to any laboratory, is a place from where the characteristics of weather of a location are observed to understand the condition/state of the atmosphere nearer to the earth surface. Crop weather observatory in particular is a place from where the state of the part of the atmosphere or weather to which the crop plants are exposed for understanding its influence on agricultural crops and animals is observed.

Meteorological observatory is a place where several weather-recording instruments are installed to record data on weather elements. Whereas, crop weather observatories or Agrometeorological observatories are specialized observatories to record data on crop environment required for understanding the crop-climate interactions.

The routine measurement of various weather parameters and reporting is an important part of worldwide collection of weather data and is therefore an important and valuable service. As the climate has no boundaries, the exchange of data between different parts of country and among different countries is compulsory except for certain classified data, which cannot be exchanged due to certain compulsions.

The crop weather observatory is a surface observatory and is of class-B as per the classification of India meteorological Department (IMD). These observatories are equipped with both eye reading and self-reading instruments, which measures various phenomenon's to describe the state of atmosphere near and around the surface of the earth. This is

Manual on Practical Agriculture Meteorology



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