

# **AGRONOMY AT A GLANCE -**

**vol.1 3rd Ed**

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**Agrotech Publishing**

**3<sup>rd</sup> EDITION**

# **AGRONOMY AT A GLANCE**

**(Vol-1 Basic and Applied Fundamentals)**

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# FOREWORD

Agronomy, one of the prominent branches of Agriculture, assumed new dimensions to its varied fields of specialization considering enormous breadth and diversity of the subject. A Number of books have been written by different authours encompassing various fields of agronomy. However, due to cost involved and limited availability of time with the students, these books remains unread.

The experience shows that there is a need for a book exhaustively covering different aspects of agronomy presented in a lucid and accessible manner. To fill up this gap, a book was written by the author "**AGRONOMY AT A GLANCE**" during the year 2001, which was very much liked by the students. This book was further expanded and published in two volumes on the name of "Agronomy at a Glance Vol-1 Basic and Applied Fundamentals and Vol.-2 Objective Fundamentals" to make it more usefiul for the students. The book is written by experienced teachers and well known agronomists.

The abridged information in two volumes of this book provides an instant material for all inquisitive minds to prepare for different examinations, competitions, interviews, *viva-voce* in the discipline of agronomy and allied subjects. It is entirely satisfying that this book covers almost all the aspects of agronomy in question-answer form. The answers are self explanatory. Fill in the blanks and multiple choice questions embodied in the second volume of the book will not only enable the readers to revise knowledge quickly but will also inculcate an understanding of the subject in depth. In nut shell it can be gleamed that a scholar seeking knowledge in any branch of agronomy will readily find the desired information in two volumes of the book. All the chapters in this book have been meticulously comprehended, compiled and presented by the authours with a fine skill. I am over whlelmed with the contents of this book and tempted to comment that the authours have attempted successfully reflecting a sea into pot.

I earnestly hope that this concise monumental compilation will go a long way serving the need of teachers, students, competitors and agricultural experts pursuing their interests in the areas of agronomy. I wish the endeavours a grand success and wide acceptability of this book by the readers.

*S. S. Chahal*

**S.S. Chahal**  
Vice-Chancellor  
MPUAT, Udaipur

# PREFACE TO 3<sup>rd</sup> EDITION

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Agronomy, one of the most important branches of Agriculture, assumed newer dimensions to provide favourable environment to the crop for higher productivity. A number of books have been written dealing with specific branches of agronomy such as agrometeorology, crop management, soil management, nutrient management, water management, weed management, dryland agriculture, etc. The experience shows that either these books are not available to most of the students or if available they remain unread due to lack of adequate time. Therefore, to cater the needs of students competing for various examinations/ interviews the book "AGRONOMY AT A GLANCE" has been written.

The book "AGRONOMY AT A GLANCE" written during 2001 was well accepted by the readers. Therefore, it was decided to further expand the book, in the form of two volumes "Vol. 1 Basic and Applied Fundamentals and Vol. 2 Objective Fundamentals" separately.

The book covers almost entire field of Agronomy in ten chapters in the form of question answers. The questions are framed very critically in a manner they cover the entire main topics step by step. No doubt the two volumes of the book would be of paramount importance for students appearing for interviews, viva-voce, comprehensive and other competitive examinations as it would help them to revise the entire agronomy within a short time and recollect the vast knowledge they gained by reading different books of agronomy. The glossary of agronomic terms, list of important books of agronomy, common weeds associated with different crops, conversion factors for different units, area, production and productivity of crops, important abbreviations etc. are appended at the end which will be of added advantage.

We sincerely thank the Agrotech Publishing Academy, Udaipur for publishing this book. Suggestions for improvement of the present book from worthy teachers and students will be gratefully acknowledged.

**P.L. Maliwal**

**S.L. Mundra**

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# Chapter – 1

## Introductory Agronomy

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### **Q.1 What is agriculture?**

**Ans.** The term agriculture is derived from the latin words 'ager' or 'agri' meaning 'soil' and 'cultura' meaning 'cultivation'. 'Agriculture' is a very broad term encompassing all aspects of crop production, livestock farming, fisheries, forestry, etc.

### **Q.2 Define agronomy.**

**Ans.** Agronomy is a branch of agricultural science which deals with principles and practices of soil, water and crop management. This term is derived from Greek words 'agros' meaning field and 'nomos' meaning 'to manage'.

In recent times, agronomy has assumed newer dimensions and can be defined as a branch of agricultural science that deals with methods which provide favourable environment to the crop for higher productivity. Environment is defined as the aggregate of all the external conditions and influences/affecting the life and development of an organism. Norman (1980) has defined agronomy as the science of manipulating the crop environment complex with dual aims of improving agricultural productivity and gaining a degree of understanding of the process involved.

### **Q.3 State the relationship of agronomy with other sciences.**

**Ans.** Agronomy is a synthesis of several disciplines like soil science, agricultural chemistry, crop physiology, plant ecology, biochemistry and economics. The soil physical, chemical and biological properties have to be understood thoroughly to effect modification of the soil environment. Similarly, it is necessary to understand the physiology of crops to meet their requirements. Development in these subjects

help in developing new practices which are simpler and economical to provide favourable environment to the crop. Development of potential herbicides made revolutionary changes in weed control. Advances in economic analysis help in production of crops economically. For efficient utilization of resources, system approach is better than individualistic approach. Instead of taking individual crop into consideration for taking decisions, cropping system as a whole is considered. Fertilizer recommendation for an entire cropping system saves considerable amount of fertilizer nutrients compared to recommending fertilizers for individual crops.

#### **Q4. What are the basic principles of Agronomy?**

**Ans.** The fundamental principles of agronomy may be listed as

- (i) Planning, programming and executing measures for maximum utilization of land, labour, capital, sunshine, rain water, temperature, transport and marketing facilities;
- (ii) Choice of crop varieties according to agro-climate, land situation, soil fertility, season and method of cultivation;
- (iii) Field management by tillage, preparing field channels and bunds for irrigation and drainage, checking soil erosion, grading and levelling and adoption of suitable land improvement practices;
- (iv) Adoption of multiple cropping and mixed or intercropping to ensure harvest even under adverse weather conditions;
- (v) Application of adequate and balanced nutrients to the crop or cropping sequence and improvement of soil fertility and productivity. Correction of adverse effect of soil reactions and conditions and increasing soil organic matter through application of green manure, FYM, biofertilizers and profitable recycling of organic wastes;
- (vi) Selection of quality seed or seed material and maintenance of required plant density per unit area with healthy and uniform seedlings;
- (vii) Proper water management with respect to crop, soil and environment through conservation and utilisation of soil moisture. Efficient use of harvested water for life saving or protective irrigation, scheduling irrigation at critical stages of crop growth;
- (viii) Adoption of adequate plant protection measures against weeds, insect-pests, pathogens as well as climatic hazards and correction of deficiencies and disorders;

- (ix) Adoption of suitable management practices including intercultural operations to get maximum benefit from low monetary and non monetary inputs;
- (x) Adoption of suitable method and time of harvesting of crop to reduce field damage and to vacate land for succeeding crops and efficient utilisation of residual moisture, plant nutrients and other management practices;
- (xi) Adoption of suitable post harvest technologies.

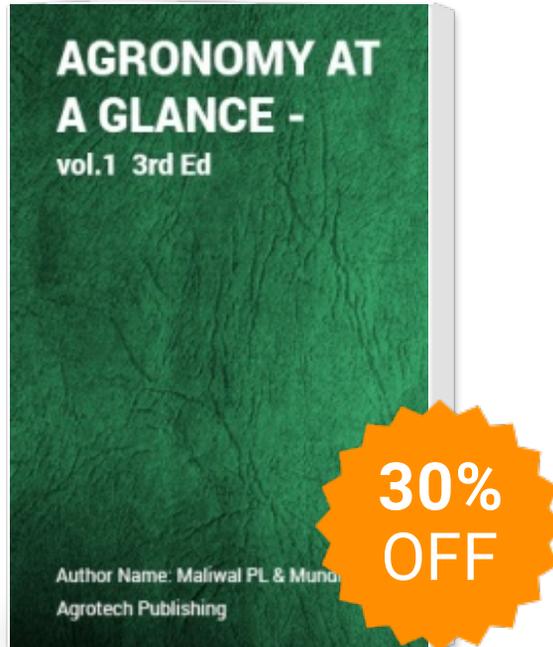
**Q.5 What is the scope of agronomy?**

**Ans.** Agronomy is a dynamic discipline. With the advancement of knowledge and better understanding of plant and environment, agricultural practices are modified or new practices developed for high productivity. For example, availability of fertilizers has necessitated the generation of knowledge on the method, quantity and time of application of fertilizers. Similarly, availability of herbicides for the control of weeds has led to development of a vast knowledge about selectivity, time and method of application of herbicides. Gigantic irrigation projects are constructed to provide irrigation facilities. However, these projects created side effects like water logging and salinity. To overcome these problems, appropriate water management practices are developed. Population pressure is increasing but area under cultivation is static. More number of crops have, therefore, to be grown on the same piece of land in an year. As a result, intensive cropping has come into vogue. Similarly, no tillage practices have come in place of clean cultivation as a result of increase in cost of energy. Likewise, new technology has to be developed to overcome the effect of moisture stress under dryland conditions.

As new varieties of crops with high yield potential become available, package of practices has to be developed to exploit their full potential.

The factors restricting increased agricultural production are low soil fertility, crop varieties of low genetic yield potential, poor agronomic practices, inadequate or non-existent control of diseases and insects, non-availability of production inputs, government economic policies affecting agriculture and weak research and extension programmes. Restoration of soil fertility, preparation of good seedbed, use of proper seed rates, correct dates of sowing for each improved variety, proper conservation and management of soil moisture and proper control of weeds are agronomic practices to make our finite land and water resources more productive.

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