

## PREFACE

Allelopathy is a new field of science, as the term 'Allelopathy' was coined by Prof. Hans Molisch, a German Plant Physiologist in 1937. Till now lot of Allelopathy research work has been done in various fields of Agricultural and Plant Sciences. However, there is no compilation of various Research Methods used. Every scientist is conducting research in his own way. It is causing lot of problems to researchers working in underdeveloped/Third World Countries in small towns without Library facilities. Therefore, to make available the standard methods for conducting allelopathy research independently, this multi-volume book has been planned. Since allelopathy is multi-disciplinary area of research, hence, volumes have been planned for each discipline.

In all the conferences held since 1990's in India or in Foreign countries, a need has always been felt for a Manual of Allelopathy Research Methods. During II International Allelopathy Conference, New Delhi (September 6-8, 1994), it was decided that a Book "**Methodology of Allelopathy**" may be compiled. Prof. S.S. Narwal, India and Prof. G.R. Waller, Oklahoma State University, Stillwater, USA agreed to prepare this Book. But the Project was later shelved. Since then Prof. Narwal has been strongly feeling to prepare such a Book. After 10-years, Prof. S.S. Narwal has planned this multi-volume Book **Research Methods in Plant Sciences: Allelopathy**. Three volumes (Volume 1. Soil Analysis, Volume 2. Plant Protection and Volume 3. Plant Pathogens) of this Book have been released during the **IV. International Allelopathy Conference, August 23-25, 2004 at Haryana Agricultural University, Hisar-125 004, India**. Five volumes (Volume 4. Plant Analysis, Volume 5. Physiological Processes, Volume 6. Biochemical Processes, Volume 7. Forestry/Agroforestry Research and Volume 8. Isolation, Identification and Characterization of allelochemicals are under preparation.

The Book series "**Research Methods in Plant Science: Allelopathy**" aims to provide basic information about the various methods to Researchers so that he can conduct research independently. The methods have been described in a simple way just

like “DO IT YOURSELF” Book. Now it is hoped that researchers can do research independently by following steps given in this Book series

This book consists of 20 Chapters, describing the methods to analyse various types of soil properties. The Book is divided into three Sections: General, Physico-chemical properties and Soil microbiology. The Section I. General, provides very elementary and basic information about the various equipments and apparatus used to determine various concentrations. Further, methods of collecting soil samples for various types of soil analysis have been described. Besides, pot culture techniques have also been explained. In Section II Soil Physico-chemical properties, 14 Chapters describes methods of determining various Physico-chemical properties (Soil Texture, Structure, Soil Moisture, Pore Space etc.) of soils. Besides, methodology for determining pH, CEC and plant nutrients (Carbon, Phosphorus, Potassium, Sodium, Calcium, Magnesium, Sulphur, Micronutrients and Toxic metals) has been given. In Section III. Soil microbiology, microbiological processes and biological nitrogen fixation methods have been given.

This book provides complete information for Soil Analysis in simple and lucid language. The Figures/ illustrations have been given at appropriate places in text. It will prove very useful to undergraduate and post graduate students and teaching Faculty for Class Room and Laboratory experiments as well as for research. We are thankful to Dr. S. S. Kukul, Professor, Department of Soil Science, Punjab Agricultural University Ludhiana for his critical review of Manuscripts. We also express thanks to Sh. Pawan Kumar and Sh. Rajesh Ojha to print this Book in the short time.

We invite valuable suggestions from students and researchers, to make further editions of this Book more useful and meaningful.

August 23, 2004

**S. S. Narwal**  
**S. S. Dahiya**  
**J. P. Singh**