

Preface to the Third Edition

In view of the developments in the field of biotechnology, the scope of this textbook has been broadened in this revised edition, but the basic philosophy remains the same. Protocols are given in the chapters where laboratory exercises are essential for the students. References have been quoted at the end of each chapter. Emphasis is placed on application of a technique, its contribution and impact on crop improvement.

Chapters on plant tissue culture have been suitably amended wherever needed but the basic aspects remain the same except for few additions. Chapters on genetic material, organization of DNA in the genome and basic techniques for understanding the recombinant DNA technology remains the same.

The recombinant DNA technology part in this revised edition has been broadened to a large extent. Chapter on gene transfer methods has been expanded with emphasis on gene silencing and development of marker free transgenics. A new chapter on chloroplast and mitochondrion DNA transformation has been introduced. Chapter on Transgenics in Crop Improvement has been revised with some recent examples of transgenics developed for various characters and its implications have been added as new chapters. Impact of Recombinant DNA Technology chapter details the status of biotech crops and arguments made in favor and against the GM crops in detail and in other role of rDNA technology in other fields of biotechnology. Biosafety issues on biotech crops are taking a centre stage and so many concerns have been raised. Great emphasis has been laid on a chapter on biosafety and regulatory framework. Issues and controversies arisen at different times on biosafety have been given. Regulatory frameworks for the release of transgenic crops and biotech products in different countries of the world have been explained. Chapters on Bioinformatics and Intellectual Property Rights have been expanded to great length. IPR issues as such and with respect to biotechnology and protection mechanism for plants in the form of breeders rights have been explained. Molecular markers and marker assisted selection chapter has been expanded to give more information on some of the new molecular markers, genetic fingerprinting and further updated by giving some recent examples. Other chapters on gene cloning, *in vitro* mutagenesis, transposons and gene tagging, gene isolation and genomics have been amended, updated wherever some lacunas were there. Metabolomics portion has been added in the chapter on genomics.

I am grateful to the reviewers of the previous editions. It enabled me to improve this book. I am thankful to my well wishers, colleagues and innumerable students who have made great contributions directly or indirectly by giving suggestion for improvement in one way or the other for this revised edition.

Nothing can move without the will of God. I am lucky and fortunate enough to have the blessings of my gracious Almighty God to complete the task of writing this book. I am grateful to my elders for giving me strength and support, and to my wife and children, Komaljit and Jasmit for their perseverance.