

**Plant Growth Regulators in Tropical and Sub-tropical Fruit Crops**  
**Part - I**

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# Contents

*Preface* *xv*

*About the Editors* *xvii*

## Part - I

1	Plant Growth Regulators	1
2	Brassinosteroids and their Use in Fruit Crops	14
3	Role of Paclobutrazol in Fruit Crops and its Residual Fate	35
4	Plant Growth Regulators in Aonla	52
5	Plant Growth Regulators in Avocado	64
6	Plant Growth Regulators in Banana	76
7	Plant Growth Regulators in Ber	92
8	Plant Growth Regulators in Citrus	113
9	Plant Growth Regulators in Custard Apple	143
10	Plant Growth Regulators in Date Palm	164
11	Plant Growth Regulators in Fig	187
12	Plant Growth Regulators in Grape ( <i>Theory and Practical</i> )	204
13	Role of Plant Growth Regulators in the Cultivation of Grapes	241
14	Plant Growth Regulators in Guava	250

15	Plant Growth Regulators in Jamun ( <i>Syzygium cumini</i> Skeels)	263
16	Plant Growth Regulators in Kokam	285
17	Plant Growth Regulators in Litchi	293

## **Part - II**

18	Plant Growth Regulators in Mango ( <i>Mangifera indica</i> L.)	315
19	Plant Growth Regulators in Mulberry ( <i>Morus alba</i> L.)	469
20	Plant Growth Regulators in Papaya	486
21	Plant Growth Regulators in Passion Fruit	505
22	Plant Growth Regulators in Phalsa ( <i>Grewia subinaequalis</i> D.C.)	520
23	Effect of Plant Growth Regulators on Propagation and Fruit Production in Phalsa ( <i>Grewia subinaequalis</i> DC)	527
24	Plant Growth Regulators in Pomegranate	535
25	Plant Growth Regulators in Sapota	564
26	Plant Growth Regulators in Strawberry	585
	<i>Index</i>	625

# Preface

Plant growth regulators or plant bio-regulators have emerged as a powerful tool for improving the performance of horticultural crops in general and fruit crops in particular. Diverse group of plant growth regulators like auxins, gibberellins, cytokinins, abscisic acid, ethylene and growth retardants, polyamines, etc. at various concentrations are reported to influence flowering, fruit set, retention, plant growth and development, ripening, shelf life and fruit quality characters in tropical and subtropical fruit crops. Agricultural universities and institutes across the country have scientifically demonstrated the potential of plant growth regulators in increasing the profitability of fruit growers. Many scientists have worked on the nature and action of plant growth regulators on different fruit crops for the last few decades and as a result remarkable recommendations have been made for increasing production and productivity of many tropical and subtropical fruit crops. This necessitated the need to present this data in a clear, concise and comprehensive manner for the benefit of the students, scientists and farmers.

In this book we have tried to focus the available literature in a comprehensive manner. Wherever possible, we have highlighted useful reviews which provided background information, along with recent publications that have contributed significantly to the literature. This book provided recent information on role of plant hormones, how their concentrations are regulated, and how they modulate the various plant processes. 'Plant Growth Regulators in Tropical, Sub-tropical Fruit Crops' is a comprehensive book covering function of plant growth regulators in propagation including micro-propagation, growth, flowering and fruiting behaviour, yield, quality, shelf life and stress management etc. This book has 26-chapters covering most of the tropical and sub-tropical fruit crops like aonla, avocado, banana, ber, citrus, custard apple, date palm, fig, grape, guava, jamun, kokam, litchi, mango, mulberry, papaya, passion fruit, sapota, phalsa, pomegranate and strawberry. This book is the result of painstaking effort and keen abiding interest to improve the use of plant growth regulators in tropical and subtropical fruit crops so as to improve their quality and productivity.

**Dated: 1st February, 2019**

**Prof. (Dr.) S.N. Ghosh  
Dr. T. R. Ahlawat  
Dr. R. K. Tarai**



## About the Editors

**Dr. S.N. Ghosh** (Dr. Satyanarayan Ghosh) started his career as Junior Horticulturist (Assistant Professor) in All India Co-coordinated Research Project in Cashew, where he worked for a period of almost more than 7-years after which he joined as Associate Professor and later as Professor of Horticulture on 27.07.1998. During his service as Junior Horticulturist, most significant achievement was release of a cashew variety-**JHARGRAM-1** as well as development of package and practices for cultivation of cashew in West Bengal. Another significant achievement during his carrier was popularization of Mosambi-sweet orange in West Bengal through development and dissemination of location-specific production technology. For his significant contribution in Citrus, “**Dr. Shyam Singh Best Scientist Award on Citrus Research -2009-2010**”, was conferred upon Dr. Ghosh by National Research Centre for Citrus( ICAR, Govt. of India), Nagpur, India. Success story of his last 20 years of concentrated efforts is introduction of grapes in West Bengal. He has developed technology for higher production of sweet table grapes in West Bengal. Besides, he has developed number of technologies for cultivation of Aonla, Pomegranate, Sapota, Ber, Bael, Custard apple, Jackfruit, Water apple, Wood apple, Mango, Guava, Karonda and Fig in red and laterite zone of West Bengal.



Dr. Ghosh shouldered additional responsibilities in many administrative position like Officer-in-Charge of All India Coordinated Research Project on Cashew (BCKV Centre); Associate Director of Research of the Regional Research Station, Jhargram, West Bengal; Head, Department of Fruits and Orchard Management, B.C.K.V.; Dean, Faculty of Horticulture, Bidhan Chandra Krishi Viswavidyalaya, West Bengal; Associate Dean, College of Agriculture, Susunia, Bankura, West Bengal. He had organized one National and one International Symposium on Minor Fruits in 2006 and 2011 respectively. *Society of Minor Fruits, Medicinal & Aromatic Plants* (SMFM&AP) formed under dynamic leadership of Dr. Ghosh and now he is President of the Society. The society (SMFM&AP) Published a journal- **International Journal of Minor Fruits, Medicinal and Aromatic Plants** and Dr. Ghosh is associated with the journal as Editor-in-Chief (web site-<http://www.ijmfmap.in>) since its inception in 2015.

Dr. Ghosh successfully guided 9 Ph.D. students and 10 M.Sc. students and handled 12 Research Projects as Principal Investigator funded by ICAR, State Government and Private Organizations. He has published more than 200 research papers in different reputed journals at national and international level. He has visited a number of countries like Morocco, China, Malaysia, Portugal, USA, Azerbaijan, Sri Lanka and Bangladesh and presented his research papers in International conference, seminar/ symposium.

He has published 7 nos. edited books on fruit crops viz., i. Tropical and Sub-tropical Fruit Crops: Crop Improvement and varietal wealth (Part-I and Part-II); ii. Temperate Fruit Crop Breeding: Domestication to Cultivar Development (Part-I and Part-II); iii. Breeding of underutilized fruit crops (Part-I and Part-II); iv. Underutilized Fruit Crops: Importance and Cultivation (Part-I and Part-II) v. Minor Fruits: Nutraceutical Importance and Cultivation (Part-I, II and III), vi. Temperate Fruit Crops :Theory to Practical (Part I and Part II) and vii. Cultivate Minor Temperate Fruits Scientifically (Part-I and Part II).

**Dr. Ranjan Kumar Tarai** was born on 30<sup>th</sup> May, 1977 and obtained his M.Sc (Hort.) in Fruits and Orchard Management during 2002 and Ph.D. (Hort.) in Fruits and Orchard Management during 2006 from Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur, Nadia, West Bengal. He started his career in 2006 as Subject Matter Specialist (Horticulture) at Krishi Vigyan Kendra (Gajapati) and later on joined as Junior Scientist (Horticulture) at Regional Research and Technology Transfer Station, Bhawanipatna & as Programme Coordinator at KVK, Kalahandi under Orissa University of Agriculture and Technology, Bhubaneswar.



Dr. Tarai is basically a Pomologist inclined to fruit research and teaching. He has an experience of over 12 years of teaching, research and extension. He has published more than 45 research papers in national and international journals, 26 popular articles, 07 book chapters, 20 extension booklets & Newsletters to his credit. He is a life member of several societies in the field of Horticulture. He has devoted his works in development and transfer of technologies in fruits (especially minor fruit crops), vegetables and horticulture based farming system suitable for resource poor area. Currently he is working as Associate Professor (Fruit Science) at College of Horticulture, Chiplima under Orissa University of Agriculture and Technology, Bhubaneswar.



**Dr. T R Ahlawat** is presently serving as an Associate Professor in the Department of Fruit Science, ASPEE College of Horticulture and Forestry with the additional charge of Associate Director of Research in Navsari Agricultural University, Navsari, Gujarat. He is actively involved in teaching for the past twelve years. He has taught 9 courses in different disciplines of Horticulture at the UG level and 14 courses at the PG level. Till date, he has guided 9 M.Sc. students and 4 Ph.D. students and is currently guiding 7 postgraduate students. He was awarded the Best Teachers Award by Navsari Agricultural University in the year 2015. He has compiled three practical manuals, published more than 28 popular articles and has more than 56 research papers in national and international journals to his credit. He has prepared several reports and policy documents pertaining to Horticulture and has authored/co-authored 17 lead papers in various seminars, symposia and workshops. He has published 2 books, 10 Souvenirs of Seminars/Symposia and 8 University Publications. He has contributed 18 chapters in various books on Horticulture. He has actively and efficiently organized an ICAR sponsored winter school, a national level seminar, a national workshop, a brain storming session and a global conference in the University. His area of research involves urban horticulture, plant propagation, crop regulation and post harvest management of horticultural crops. He is the Joint Secretary of Horticultural Society of Gujarat, Navsari and Fellow of Confederation of Horticulture Association of India and has membership in five scientific and agricultural societies of India. He was bestowed with CHAI Fellowship in 2014 and over the years awarded for his contribution to horticultural research by various societies and associations.



