

## Fundamentals

**Online Available** amazon.in flipkart

of Horticulture

As Per the Dean's Committee of ICAR and New Education Policy (NEP)

SR. SCIENTIFIC Publications 🏖



Krishan Pal Shubham Gupta Kuldeep Kumar Bhargay **Abhay Saini** 



# Fundamentals of Horticulture

As Per the Dean's Committee of ICAR &
New Education Policy (NEP)

#### **Authors**

Dr. Krishan Pal

Associate Professor Department of Agricultural Sciences IFTM University, Moradabad (U.P)

#### Dr. Shubham Gupta

Assistant Professor Department of Agricultural Sciences IFTM University, Moradabad (U.P)

### Dr. Kuldeep Kumar Bhargav

Assistant Professor Department of Agricultural Sciences IFTM University, Moradabad (U.P)



Mr. Abhay Saini

Assistant Professor Department of Agricultural Sciences IFTM University, Moradabad (U.P)



## S.R. Scientific Publications



## S. R. Scientific Publications

8. Gandhi Nagar, Mear Paliwal Park, Agra

Pin code - 282003, INDIA

Phone No.: 0562 - 4042663, 09927426509 E-mail: srscientificpublication@gmail.com Web: www.srscientificpublication.com

Published by Mr. Anuj Shrivastava for S. R. Scientific Publications \*Fundamentals of Horticulture\*

@ Author's

First Edition: 2023

ISBN: 978-93-93483-13-3

Laser - typesetting: Prakash Graphics

Printer: Pawan Printer, Agra

No Part of this work covered by the copyright hereon may be reproduced or used in any form or by any means - graphics, electronic particles and the copyright hereon may be reproduced or used in any form or a participation. by any means - graphics, electronic or mechanical including but not limited to photocopying, recording, taping, web distribution including but not limited to photocopying, recording, taping, web distribution, information, networks or information storage and retrieval system - without the written permission of the publisher.

The Authors and/or the publisher would not be responsible for any loss/damage including by the user of the book for any mistake that have inadvertently crept in. Only Agra shall be the jurisdiction for any legal dispute.

Laser-typesetting: Alok Computers

## CONTENT

S. No.	CHAPTERS	Page No.
1	Horticulture: Importance and Scope, Definition, Branches of Horticulture, Importance of horticulture, present status of horticulture, Horticulture Exports from India, Importance of horticulture in the national economy, Scope of Horticulture.	01-05
2	Classification of Horticultural Plants: On the basis of duration of life/life span, climatic requirements, growth habit and physiological characters, plant parts used for consumption, whether leaves are shed during the year, pollination type, longevity, botanical relationship, of rate of respiration, photoperiod, type of fruits	06-10
3	Soil and Climatic Requirements of Horticultural Crops: Soil, Types of soil, Physical Properties of Soil, Chemical Properties of Soil, Soil Management Practices, Climate, Light, Light intensity, Quality of light, Duration of light, Temperature, Humidity (moisture) and frost, Rainfall, Wind.	11-18
4	Nursery Raising in Horticultural Crops: Importance of a plant nursery, Types of nursery, Temporary nursery, Permanent nursery, Ornamental nursery, Vegetable nursery, Fruit plant nursery, Forest nursery, Open field nursery, Hi-tech nursery, Site selection, Critical Site Selection Criteria, Secondary Site Selection Criteria, Layout of model nursery, Plant Propagation Structures, Greenhouses, Hot frames (Hot beds), Cold frames, Lath houses, Net house, Mist chamber, Plug Trays, Growing media,	19-37
5	Methods of Plant Propagation: Sexual propagation, Merits of sexual propagation, Demerits of sexual propagation, What is a seed?, Asexual propagation, Merits of asexual propagation, Demerits of asexual propagation, Plant propagation by cutting, Plant Propagation by Layering, Natural Forms of Layering, Plant propagation by grafting, Rootstock, Scion, Bridge grafting, Top working, Budding, Propagation by Tissue culture, Plant Propagation by Specialized Structures.	38-65
6	Plant Propagating Structures: Greenhouses, Hot Frames (Hot Beds), Cold Frames, Lath Houses, Propagation frames, Net House, Bottom heat box, Mist propagation unit, Growing rooms.	66-71
7	Orchard Establishment: Principles and Practices: Location and site selection for the orchard, Preliminary operations for orchard establishment, Planning of orchard, Laying out of the orchard, System of planting, Square system, Rectangular system, Triangular system, Hexagonal system, Quincunx system, Contour system, Spacing of Fruit Trees, Planting season, Planting methods, Transplanting, High density planting system, Soil Management Practices of Orchard: Tillage, Clean	

	Cultivation, Sod Culture, Mulching, Clean Basin Management, Intercrops, Cover Crops, Green Manuring Crops, Manuring and Fertilization, Applications of Fertilizers and Manures, Leaf Sampling in	
8	Training and Pruning in Horticultural Plant: Training, Central leader system, Open centre or vase system, Delayed open centre or modified leader system, Espaliers, Bower System, Tatura Trellis system, Ringing and Girdling, Notching, Bending, Smudging, Root pruning, Bahar treatment, Pruning, Thinning out, Heading back, Bulk pruning, Thin wood pruning, Frame pruning, Maintenance pruning, Renewal pruning, Difference between training and pruning.	87-96
9	Pollination Pollinators and Pollinizers: Self - Pollination, Autogamy, Geitonogamy, Mechanism promoting self-pollination, Cleistogamy, Advantages of self - pollination, Disadvantages of self- pollination, Cross-Pollination, Hydrophilous Flowers, Zoophilous flowers, Anemophilous flowers, Entomophilic flowers, Ornithophilous flowers, Dicliny, Dichogamy, Heterostyly, Herkogamy, Self-incompatibility, Male sterility, Genetic consequences of self and cross-pollination, Pollinators, Pollinizers.	97-105
10	Fertilization and Parthenocarpy: What is Fertilisation, Process of fertilization, Parthenocarpy and Apomixis, Similarities and Differences between parthenocarpy and apomixes, Types of Parthenocarpy, Advantages and Disadvantages of Parthenocarpy,	106-110
11	Use of Plant Growth Regulators in Horticultural Crops: Phytohormone, Plant Growth Regulator (PGR), Classification of Plant Growth Regulators, Auxins {IAA, IBA, NAA, 2, 4-D etc}, Gibberellins {GA <sub>1</sub> , GA <sub>2</sub> , GA <sub>3</sub> etc}, Cytokinenins {Kinetin, Zeatin}, Etylene {Ethrel}, Dormins {Abscissic Acid (ABA), Phaseic Acid}, Uses of Plant Growth Regulators in Fruit crops.	111-115
12	Irrigation Methods for Horticultural Crops: Importance of Irrigation, Methods of Irrigation, Surface Method, Sub-surface irrigation, sprinkler irrigation, Drip Irrigation Method.	116-122
13	Unfruitfulness in Horticultural Crops External Factors Climate. Disturbed Moisture in Soil, Nutrition, Rootstocks, Pruning, Plant Age, Chilling Requirements, Spraying at Full-bloom, Internal Factors, Dicliny or Uni-sexuality, Dioecious, Dichogamy, Self-sterility, Heterostyly, Physiological Reasons, Pollen Tube Growth,	123-127
14	Glossary	

#### **ABOUT THE AUTHORS**



Dr. Krishan Pal is presently working as an Associate Professor in IFTM University, Moradabad. He received his M.Sc. (Ag.) Horticulture with merit certificate award and Ph. D. Horticulture from CCS University, Campus Meerut. He has qualified ASRB-NET in Horticulture in 2008. Dr. Krishan Pal has more than 16 years teaching and research experience at UG and PG level. He has to his credit more than 30 research papers in national and international journals and several book chapters, popular articles. He has supervised several PG and one Ph. D. student. He is also actively engaged in

extension activities and delivered many radio talks.



**Dr. Shubham Gupta** obtained M.Sc. (Ag) Horticulture from University of Lucknow. He did his Ph. D. in Fruit Science from C. S. Azad University of Agriculture and Technology, Kanpur. He has qualified the ASRB - NET. Dr. Gupta is presently working as an Assistant Professor in IFTM University, Moradabad. He also served in C. S. A. U. A. & T. as Teaching Associate. He was awarded Scientist Associate Award for his outstanding contribution in the field of Fruit Science. He has Published more than 10 research papers in national and international journals, book chapters and popular articles.



Dr. Kuldeep Kumar Bhargav is an Assistant Professor (Horticulture) at IFTM University, Moradabad (U.P.). Dr. Bhargav has graduated from A.N.D.U.A.&T., yodhya. He has completed his M.Sc. Horticulture in Vegetable Science from Central Agricultural University, Imphal, Manipur and a Ph.D. in Vegetable Science from A.N.D.U.A. &T., Ayodhya. Dr. Bhargav has more than two years of teaching and research experience. He has 12 research papers, 2 book chapters, and 18 popular articles published in prestigious national and international journals. Dr. Bhargav was awarded the

Young Scientist award in 2017 for his outstanding contribution to Vegetable Science.



Mr. Abhay Saini, currently working as an Assistant Professor in IFTM University, Moradabad. He did his PG in M.Sc. (Ag) Horticulture (Vegetable Science) with Gold Medal from in IFTM University, Moradabad. He has more than two years of teaching and research experience. At present, he is perusing his Ph. D. in Vegetable Science. Mr. Saini published one patent from his PG research.

## S. R. Scientific Publication

8, Gandhi Nagar, Near Paliwal Park, Agra - 282003 (U.P) INDIA

Phone No :- 09927426509, 0562-4042663 E-mail :- srscientificpublication@gmail.com Web:- www.srscientificpublication.com

