

HIGH-TECH FRUIT FARMING

Innovations for Quality and Yield Enhancement

HIGH-TECH FRUIT FARMING

Innovations for Quality and Yield Enhancement

Dr. Suresha D. Ekabote

Senior Professor of Plant Pathology and Dean College of Horticulture,
Hiriyur, Karnataka (Horticulture Crop Protection)
College of Horticulture, Hiriyur, KSNUAHS, Shivamogga

Dr. Esther Lalruatsangi

Assistant Professor (Fruit Science)
College of Horticulture, Thenzawl, Mizoram
Central Agricultural University (Imphal)

Dr. Mohammed Nayeem

Quality & Hygiene Manager
Rixos Gulf Hotel Doha, Qatar

Ms. Yogita Thaper

PG Scholar (Agriculture-horticulture -fruit science)
Mata Gujri College Fatehgarh Sahib Punjab

Ms. Shreya Patyal

Facilitator (HP-SHIVA) (Agriculture-horticulture -fruit science)
Mata Gujri College Fatehgarh Sahib Punjab



VITAL BIOTECH PUBLICATION

Kota, Rajasthan, India

<http://www.vitalbiotech.org/bookpublication/>

An International Publishers

VITAL BIOTECH get Accredited by following International organization



<https://www.portico.org/publishers/vital/>

101 Greenwich Street, 18th Floor
New York, NY 10006

Copyright © 2026 VITAL BIOTECH PUBLICATION

Published by Vital Biotech Publication

First Edition: 2026

All Rights Reserved

No part of this book may be reproduced in any form, by photostat, microfilm, xerography, or any other means, or incorporated into any information retrieval system, electronic or mechanical, without the written permission of the publisher.

Product Form:

Digital download, online and hard bound

Edition:

ISBN: 978-81-69356-08-4

Head, Production (Higher Education and Professional) & Publishing Director

Dr. Jitendra Mehta

Product Manager

Aman Saxena

General Manager

Jaya Mehta

Graphic Designer

Avneet Kaur

Information contained in this work has been obtained by Vital Biotech Publication (India), from sources believed to be reliable. However, neither Vital Biotech Publication (India) nor its authors guarantee the accuracy or completeness of any information published herein, and neither Vital Biotech Publication (India) nor its authors shall be responsible for any errors, omissions, or damages arising out of use of this information. This work is published with the understanding that Vital Biotech Publication (India) and its authors are supplying information but are not attempting to render engineering or other professional services. If such services are required, the assistance of an appropriate professional should be required.

Office Address:

VITAL BIOTECH PUBLICATION

772, Basant Vihar, Kota,

Rajasthan-324009 India

Visit us at: <http://www.vitalbiotech.org>

Contact No. +91-9784677044

Printed at: Vital Biotech Publication, Kota

Preface

Fruit farming has undergone a remarkable transformation with the integration of advanced technologies that enhance productivity, quality, and sustainability. The book, *High-Tech Fruit Farming: Innovations for Quality and Yield Enhancement*, has been developed to provide a comprehensive understanding of modern technologies and scientific practices that are reshaping commercial fruit production in the twenty-first century.

Rapid advances in precision agriculture, protected cultivation, sensor-based monitoring, automation, artificial intelligence, drone technology, biotechnology, and climate-smart production systems have revolutionized orchard management. These innovations enable growers to optimize resource use, improve fruit quality, reduce production costs, and minimize environmental impacts while meeting the increasing demand for safe and high-quality produce.

This volume brings together contributions from researchers, academicians, horticulturists, and industry experts to present current knowledge on precision orchard management, high-density planting systems, fertigation, canopy management, post-harvest technologies, disease and pest management, digital decision-support tools, and emerging innovations in fruit production. Emphasis is placed on translating scientific advances into practical applications that enhance profitability and sustainability.

The editors hope that this book will serve as a valuable resource for students, researchers, extension professionals, fruit growers, entrepreneurs, and policymakers. We sincerely acknowledge the contributions of all authors and reviewers whose expertise and dedication have made this publication possible. It is our hope that this volume will promote innovation and support the sustainable advancement of modern fruit farming.

Dr. Suresha D. Ekabote
Dr. Esther Lalruatsangi
Dr. Mohammed Nayeem
Ms. Yogita Thaper
Ms. Shreya Patyal

Dated - 30 June, 2026

CONTENTS

S. NO.		PAGE NO.
1.	Precision Fruit Farming: Concepts and Applications <i>Suresha D. Ekabote</i>	1-12
2.	Role of Biotechnology in Fruit Crop Improvement <i>Esther Lalruatsangi</i>	13-24
3.	Smart Irrigation and Water Management Technologies <i>Mohammed Nayeem</i>	25-38
4.	Protected Cultivation for High-Value Fruit Production <i>Yogita Thaper</i>	39-50
5.	Advanced Nutrient Management Strategies in Orchards <i>Priyanka Gupta, Chenu Sri Likhitha, D. Lokesh Nayak, Ashis Kumar Mohanty, Ashish Kumar</i>	51-62
6.	Use of Drones and IoT in Fruit Farming <i>Pujarani Rath, Viraj Vijay Pisal, Mounik. A, Ankit Singh Bhadauria, Pranay Pandit Chavhan</i>	63-76
7.	Climate-Smart Technologies for Sustainable Fruit Production <i>Mounik. A, Nabanita Sarkar, Suvarna B. Deore, Ankit Singh Bhadauria, Samar Thakuria</i>	77-88
8.	Post-Harvest Technologies for Quality Enhancement <i>Jasveen Saini, Angatdeep Singh, Ajaypartap Singh, Ginnat Sultana, Amal Jyothy A P</i>	89-100
9.	Integrated Pest and Disease Management Using Modern Tools <i>Shreya Patyal</i>	101-114

10. Digital Marketing and Supply Chain Innovations in Fruit Farming 115-128

*Pujarani Rath, Chenu Sri Likhitha, Ashis Kumar Mohanty,
Dikshit Patel, Pratik Raval*