

Latest Techniques in High Density Plantation of Arid Fruits (Guava, Pomegranate, Ber)

Vijay Avinashilingam, N.A.

Akath Singh

Hardayal

Pratibha Tewari



भा.कृ.अनु.प.-केन्द्रीय शुष्क क्षेत्र अनुसंधान संस्थान, जोधपुर
ICAR-Central Arid Zone Research Institute, Jodhpur



This book entitled “**Latest Techniques in High Density Plantation (HDP) of Arid Fruits (*Ber, Pomegranate, Guava*)**” comprised of manuscripts of lectures to be delivered during training course at ICAR-Central Arid Zone Research Institute, Jodhpur (Raj.) 342 003 from 17th - 21st December, 2019. This is solely a study material and does not intend for wide publicity.

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Director

ICAR-Central Arid Zone Research Institute, Jodhpur (Raj.) 342 003

Phone + 91 291-2786584 (O)

Fax + 91 291-2788706

Email director.cazri@icar.gov.in

Website <http://www.cazri.res.in>

Edited By

Vijay Avinashilingam, N.A.

Akath Singh

Hardayal

Pratibha Tewari

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भाकृअनुप-केन्द्रीय शुष्क क्षेत्र अनुसंधान संस्थान

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(Indian Council of Agricultural Research)

Jodhpur - 342 003 (Rajasthan), India



डॉ. ओम प्रकाश यादव

निदेशक

Dr. O.P. Yadav

Director

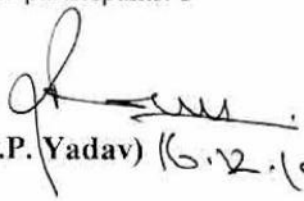
Foreword

Agriculture plays an important role in Indian economy. It is considered as the principal means for not only achieving the food security but also in providing sustainable and equitable development in the society. To ensure food security and also to feed the ever growing population of our country it is highly imperative for the researchers and extensionists to develop and disseminate cutting edge technologies in agriculture and horticulture. Over the past few decades, horticulture particularly pomology had shown a remarkable progress in terms of its contribution in agricultural and allied sector in general and arid region in particular. Fruits play a vital role in the supplementing the human diet through the vitamins and minerals.

Horticulture plays an important role in India's economy by improving the income of the rural people. This sector contributes nearly 30.4 per cent to agriculture GDP of India. According to the recent data horticulture crops in India are being cultivated in 25.87 million hectares, which is about 8 per cent of India's total cropped area. The annual horticulture produce is estimated around 314.67 MT, which includes 96.75 MT of fruits and 187.47 MT of vegetables as per the first advance estimate data released by agriculture ministry for 2018 - 19. India is the second largest producer of fruits and vegetables in the world after China. Being the second largest producer the recent emphasis on horticulture is to utilize the land profitably and attaining the nutrition security for all its citizens.

The ICAR-Central Arid Zone Research Institute is a pioneer institute in arid horticulture research as well as extension in the country. Technologies developed for ber, pomegranate, gonda, datepalm, protected cultivation of selected vegetables have made significant impact in arid and semi arid regions. As a capacity building measure, ICAR-CAZRI is organizing a Training Course on "Latest Techniques in High Density Plantation (HDP) of Arid Fruits (Ber, Pomegranate, Ber)" during 17 - 21 December, 2019, sponsored by Directorate of Horticulture (Mission for Integrated Development of Horticulture - MIDH), Government of Himachal Pradesh, Shimla. I congratulate the entire team for their efforts for organizing the Training Course and the contributors for developing well-written lecture notes. I am confident that this 5-days deliberations would bring a significant improvement in thought process of the participants. I wish the training a grand success

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(O.P. Yadav) (6.12.19)

दूरभाष नं./Telephone No.: +91-291-2786584, फ़ैक्स नं./Fax No.: +91-291-2788706 (का./Off.)

+91-291-2788484 (नि./Res.)

वेबसाईट/website : www.cazri.res.in ई-मेल/e-mail : director.cazri@icar.gov.in opyadav21@yahoo.com

Preface

Over the last few decades, the fruit production has increased rapidly in our country. India is the second largest producer of fruits and vegetables in the world after china. Fruits occupy an important place of our food. They not only play an important role in the human diet through supply of minerals and vitamins they also helps our human body to heal quickly from many problems. The recommended quantity of fruits and vegetables to be consumed by a normal healthy adult is 400 grams per day while the present per capita consumption of fruits is reported to be below 160 grams per day. Still there is a gap of 70g to 100g which has to be bridged. This opens a new trend in the global trade for the need of horticultural produces and products. So the need of the hour is to give a boost to increase the production and productivity of fruits and vegetables to achieve the Numero uno position in the world.

The arid region in India is spread over 38.7 million hectares and is characterized by high temperature, low and uneven rainfall. Because of these extreme climatic conditions it is not wise to cultivate traditional crops economically. However, these conditions greatly favor arid regions for the development of high quality arid fruits namely *ber* (*Ziziphus mauritiana*), *pomegranate* (*Punica granatum*), *aonla* (*Embllica officinalis*), *date palm* (*Phoenix dactylifera*), *lasoda* (*Cordia myxa*.) etc. The existing low productivity in these arid regions could be increased by following improved scientific production technologies and inputs. CAZRI, a premier institute of eminence working under Natural Resource Management (NRM) Division of ICAR exclusively mandated for conducting research on issues of arid zone ecosystem, in which arid horticulture research and extension is also a part for minimizing risk in arid livelihoods. The research pertaining to NRM and their effective utilization in arid horticulture including crop diversification, protected cultivation, maximization of quantity, quality and utilization of horticultural crops in resource constrained arid eco system. Its wealth of experiences particularly in *ber* (*Ziziphus mauritiana*) and *pomegranate* (*Punica granatum*) fruits would be definitely beneficial to enrich the knowledge and understanding of researchers and extension officials to take up further for the betterment of the end users.

The present 5-days Training Course on topic “Latest Techniques in High Density Plantation (HDP) of Arid Fruits (*Ber, Pomegranate, Guava*) to be held at ICAR-CAZRI during 17th - 21st December, 2019 may pave a path to mark significant improvement in HDP sector. The designed curriculum of training in HDP would make the participants to be familiar with challenges and constraints, popularization of the HDP concept in Ber, Pomegranate & Guava, Nutrient Management, micro-irrigation methods, Perspectives of IPM, IDM & Nematode Management, Supply chain & Post harvest processing including value chain, Role of transfer of technology, advantage through eNAM, Government support for horticulture entrepreneurs, recent advances and finally orientation of latest technologies in HDP. The present compendium brings out the manuscript of the lectures to be delivered during the course of training. We express our deepest sense of gratitude to the speakers and fellow scientists for their earnest efforts in preparing the manuscripts. We are grateful to the Director, ICAR-CAZRI, Dr. O.P. Yadav for his constant support and guidance for organizing this training. We are highly indebted to Directorate of Horticulture (Mission for Integrated Development of Horticulture - MIDH), Government of Himachal Pradesh, Shimla for sponsoring this training course.

Vijay Avinashilingam, N.A.
Akath Singh
Hardayal
Pratibha Tewari

Content

Sl.	Title	Page no.
1	Micro Lab & Ice Breaking <i>Dr. Dipika Hajong and Dr. Vijay Avinashilingam, N.A</i>	1-5
2	High Density Planting In Fruit Crops <i>Dr. A K Shukla, D.K.Gupta, Noor Mohammed and Keerthika A</i>	6-15
3	Soil and Water Quality Management in Arid Fruits <i>Dr. N.R. Panwar</i>	16-27
4	Water Harvesting, Conservation and Management Techniques For Maximizing Productivity From Arid Horticulture <i>Dr. R.K.Goyal</i>	28-39
5	Canopy Management and Pruning Operation in Fruit Crops <i>Dr. A K Shukla</i>	40-46
6	Latest production techniques in ber <i>Dr. P.R. Meghwal and Dr. Akath Singh</i>	47-57
7	Pomegranate production under High density plantation <i>Dr. Akath Singh</i>	58-64
8	Popularizing High Density Orchardng and Meadow Orchardng in Guava <i>Dr. P. H. Nikumbhe</i>	65-79
9	Vegetable grafting: Current status, issues and future prospects <i>Dr. Pradeep Kumar and Dr. P.S. Khapte</i>	80-88
10	Perspectives in Integrated pest management in high density orchards <i>Dr. Nisha Patel</i>	89-102
11	Integrated Disease Management in Arid Fruits <i>Dr. RituMawar</i>	103-115
12	Nematode management in high density plantation <i>Dr. R. K. Kaul</i>	116-119
13	Supply Chain of Pomegranate and its Value Addition <i>Dr. PratibhaTewari and Dr. Vijay Avinashilingam,N.A</i>	120-128
14	Processing and value addition of Pomegranate, Guava and Ber <i>Dr. Dheeraj Singh, Mr. Chandan Kumar, M.K. Choudhary and M L Meena</i>	129-141
15	Post-harvest handling and processing of arid horticultural produces <i>Dr. Dilip Jain</i>	141-149
16	Role of extension methods in TOT in Arid Region <i>Vijay Avinashilingam, N.A., PratibhaTewari, Bhagwan Singh and Om Prakash Meena</i>	150-158
17	Gaining Competitive advantage through e- NAM <i>Mr. Pramendra</i>	159-164
18	Role of NHB in Indian Horticulture with special emphasis on latest techniques in High Density Plantation of arid fruits like Guava, Pomegranate & Ber In Rajasthan <i>Dr. Sansar Ahmed</i>	165-171