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Emerging Opportunities for High-Value Fruit Crops in Bihar

Neeharika Kanth[1*] & Jyotsnarani Pradhan[2]

[1]Assistant Professor (Fruit Science), Pandit Deen Dayal Upadhyay College of Horticulture and Forestry, RPCAU, Piprakothi, Bihar-845429, India

[2]Assistant Professor (Botany, Plant Physiology and Biochemistry), College of Basic Sciences & Humanities, RPCAU, Pusa, Samastpur, Bihar- 848125, India

*Corresponding author email ID: neeharika@rpcau.ac.in

A B S T R A C T

Bihar is blessed with varied agroclimatic conditions, fertile soils and availability of agricultural labours; hence, it possesses considerable potential for developing a diversified fruit cultivation. Mango, litchi, banana and guava are important components of the state's horticultural economy. However, the increasing demand for premium fruits and changing consumer preferences and awareness about nutraceuticals importance of non-traditional fruits have created new opportunities for high-value fruit cultivation. The important new non-traditional fruit crops being grown are strawberry, dragon fruit, avocado, apple ber, pear, apple and plum. Modern propagation methods, precision irrigation, protected cultivation, post-harvest management and value addition can further strengthen the profitability of new non-traditional fruit crops production.

Keywords: *High-Value Fruit Crops, Bihar, Dragon Fruit, Strawberry, Mango, Litchi, Fruit Diversification, Value Addition*

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1. INTRODUCTION

The diversification in horticulture lead to nutritional and financial security. The introduction of new crops in Bihar will pave way for employment generation, nutritional security and improved farm profitability. Along with tropical and subtropical crops, introduction and suitability of temperate fruit crops under agroclimatic conditions of Bihar will contribute to increase in overall production of fruit crops. Nevertheless, future development of the fruit sector should extend beyond increasing production. Improving fruit quality, reducing post-harvest losses, strengthening processing infrastructure and developing efficient marketing systems are equally important for increasing farmers' income (Shruti *et al*., 2019). The growing consumer interest in premium fruits and other emerging fruit crops has also encouraged farmers to explore the suitability of such crops in the region.

2. EMERGING HIGH-VALUE FRUIT CROPS FOR BIHAR

2.1 Dragon fruit

Dragon fruit (*Selenicereus undatus*) also known as Kamalam, is an emerging high-value fruit crop with considerable potential for diversification of horticulture in Bihar. It belongs to family Cactaceae. Two variants of dragon fruit (Red fleshed and white

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fleshed) are being successfully grown in agroclimatic conditions of Bihar. This crop has gained popularity due to its distinctive appearance, consumer appeal and potential for commercial cultivation. It is cultivated commercially in several Asian countries and has gained popularity in India, particularly in Gujarat, Maharashtra, Karnataka and other states. Its cultivation requires well-drained soils, adequate sunlight, appropriate support structures and reliable irrigation. The crop also offers opportunities for value addition. But, post-harvest disorders, mechanical injury and decay require proper handling and storage practices (Wakchaure *et al*., 2024, Kumar *et al*., 2022). The demonstration orchards, validated cultivation practices, quality planting materials and reliable market is required for commercial dragon fruit cultivation in Bihar. Demonstration orchards, locally validated cultivation practices, quality planting material and reliable marketing channels can help determine the most suitable locations for commercial dragon fruit production in Bihar.

2.2 ***Strawberry***

Strawberry (*Fragaria* × *ananassa*) is a high-value fruit mostly preferred due to its unique red color and sweet acid blend taste. The crop has huge potential in post-harvest and value addition. The commercial cultivation depends on the cultivar adaptability, planting time, irrigation, disease management and harvesting practices (Shaw & Orsi, 2012). Major hindrance in strawberry cultivation is the availability of quality planting materials in Bihar. Raised beds, mulching, drip irrigation can improve crop management.

3. MAJOR CHALLENGES IN COMMERCIALIZING HIGH-VALUE FRUIT CROPS IN BIHAR

3.1 ***Unreliable or Inadequate quality planting material***

The lack of quality and authentic planting materials creates opportunity for establishment of credible fruit nurseries with authentic varieties.

3.2 ***Lack of awareness about package of practices***

The universities and institutions should provide training on package of practices for cultivation of non- traditional fruit crops in Bihar. Demonstration plots and hands-on-training will boost confidence of farmers to grow theses crops.

3.3 Climatic variability

The unprecedented high temperature, erratic rainfall, flood occurrence will affect different phenological stages from vegetative and reproductive growth affecting flowering, fruit set and post-harvest quality of these crops. Climate-resilient strategies and varieties will help in avoidance of such difficulties.

3.4 Inadequate post-harvest infrastructure

As these crops are highly perishable, the lack of proper cold storage facilities and unavailability of Insufficient packhouse capacity, refrigerated transport, cold storage and processing facilities can increase losses and restrict access to distant markets.

3.5 Market fluctuations

The lack of awareness about market channels is a big obstacle before adopting commercial cultivation of these crops. Farmers should assess market demand before committing substantial resources to a new crop.

3.6 High initial investment

High cost of planting materials and training structures, irrigation systems and protected cultivation and cold chain facilities require significant investment. So, proper financial planning should be done before investment in such crops.

4. SCOPE OF NON-TRADITIONAL FRUIT CROPS IN BIHAR

The first step in adoption of these non-traditional crops is identification of suitable crop for specific locations. the strengthening of fruit nurseries of these crops to waive off high cost of planting materials of these crops to ensure quality planting materials of these crops. The trainings by agricultural universities should provide information on planting system, irrigation schedule, disease and pest management. The proper post-harvest facilities for value addition of these crops should be developed according to crop-specific requirements and realistic production volumes. Farmer organizations, processors, retailers and institutional buyers should be connected with growers to support reliable demand and more transparent transactions. Agricultural universities and research institutions can evaluate cultivars, develop propagation protocols, improve fruit quality, study climate resilience and identify locally suitable production practices. Pilot projects should record establishment costs, input requirements, marketable yield, farm-gate prices and net returns. These data can guide future expansion and help farmers make informed decisions.

5. CONCLUSION

Bihar has considerable potential to strengthen its fruit industry by combining the advantages of established crops with carefully selected emerging high-value fruits. Research on high-value fruit crops in Bihar, together with official initiatives promoting dragon fruit and strawberry, provides a basis for exploring these opportunities.

Scientific crop selection, quality planting material, efficient irrigation, balanced nutrition, integrated pest management, post-harvest infrastructure and dependable market linkages must develop together.

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