

SHORT COMMUNICATION

Potential and scope of rainfed horticulture in Jammu subtropics

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The fruit industry in Jammu and Kashmir State forms the backbone of the state's economy and possesses great potential for horticulture development. The horticulture sector of J&K state is most vibrant sector for economic development. Area under horticultural crops has increased from mere 12 thousand hectares in 1953-54 to 5.58 lakh hectares. The major contributor to Gross domestic product of J&K is horticulture (Wani, 2008, Wani, 2009,). The state is basically a mono-cropped and rainfed economy with 40% area in Jammu division and 60% in Kashmir division. The major crops include rice, maize and wheat. Recently the farmers have also started cropping cash crops and oil seeds. However horticulture alone earns INR 1500 Crores with 75 % of the temperate fruits of India coming from Jammu and Kashmir. The Horticulture business employs over 2,50,000 people in the state. Over 20% of the total cultivated area is under horticulture crop (Chandra, 2014).

The Jammu division of the Jammu and Kashmir state is classified into three distinct agro-climatic zones. In Jammu division, largest fruit growing belt is in sub-tropical zone which is characterized by hot summers, severe dry winters and monsoons. The fruits commonly grown in this zone are citrus (kinnow, santra, and lemons), mango, guava, litchi, low chilling cultivars of peach and grapes. The low chilling cultivars of peach, plum and strawberry also have a great scope in this area.

Topography of Jammu and Kathua districts and parts of Rajouri district is more or less plain with a mild slope whereas, the topography of mid hills and high hills is undulating and sloppy. The climate is generally subtropical in the plains and temperate in the hills. Parts of Udhampur and Doda districts are drought prone in summers. The three agro-climatic zones are:-

1. Sub-tropical zone: It comprise both irrigated and unirrigated areas and goes upto an altitude of 500 meter above sea level. The kandi and unirrigated areas are primarily rainfed and their production is dependent on good precipitation during summer monsoons. The main fruits grown in the area are mango, citrus litchi, grapes, peach, pear,

strawberry, guava, aonla, ber, jamun and phalsa.

2. Intermediate zone: - It falls between altitudes of 500 to 1050 meter above mean sea level. The zone receives sufficient monsoon during summer. The main fruits grown in this area are citrus, peach, olive, kiwi and strawberry.

3. Temperate zone: - Area falling above 1050 meter comprises this zone. This zone is also pre-dominantly with very small irrigated area. The fruit crops grown in the area are apple, walnut, almond, peach, apricot, cherry and pecan nuts.

The sub-montane and low hills of Jammu division of J&K state represents the typical example of rainfed farming where farmers are totally dependent upon the mercy of nature. The sub mountain tract of Jammu (J&K), arising from Punjab plains with gentle, rugged undulating to escarpment topography, touching dry hillocks, consisting of Shivalik range and lying in the outer Himalayas is called Kandi belt (Kumar 2004). The soil of the kandi region varies from sandy loam to clay loam with gravels and stones. High intensities of rain during the monsoon season erode the fertile soil year by year and most of the runoff goes waste. Many villages in kandi areas face acute shortage of water in summer season even for domestic purposes. Water harvesting and *in-situ* moisture conservation techniques with diversification of crops are the key solution to solve the problems to some extent. Most of the farmers are growing maize, fodder crops and some pulses in kharif and wheat, mustard and chickpea in Rabi season with total dependence on rain water which is the only source of water in rainfed area. But due to the climatological shift for the last few years there have been long dry spells in Rabi as well as kharif season leading to drought conditions and sometimes total drought is faced by the farmers of the area. Dryland areas with scarce and uncertain rainfall produce low, unstable and often uneconomic yields of various crops. These lands owing to poor management practices are subjected to the processes of degradation and as are not able to sustain arable crops, particularly during the drought period. With the erratic rainfall, degraded soils,

poor crops and livestock productivity coupled with poor socio-economic base, the farmers living in this agro-ecosystem are unable to improve their income and find alternative options of income generation. Hence it becomes imperative to think about evolving certain alternate farming systems for such lands by introduction of a farming system based on agri-horticulture cropping which will be remunerative for the farmer. This new systems will ensure the increase in net profit of the farmer. The large variety of fruits produced in the state reach only to the relatively affluent upper and middle strata of the society who constitute only a minority of the Indian population. Therefore, to meet the minimum dietary requirement of the population, it is not enough to increase the production only but it is essential to reduce the cost of production also.

Keeping in view the climate, soil, topography etc, there is a tremendous scope for pushing up fruit cultivation in Jammu division. The ever increasing population pressure and the constant pressure for fuel and food have made it essential to look for additional land that can be utilized for satisfying some of these demands. The vast stretches and varieties of wastelands that exists throughout the length and breadth of Shivalik ranges of Jammu region are the areas which attract attention as the potential lands that could be identified, developed and put to gainful use by growing fruit crops like ber, mango, pomegranate, guava, aonla, phalsa, bael, behera, harad, etc. As rain fed belt is vital for achieving food security both at the state as well as the national level, strenuous efforts are needed to boost the agriculture production in this region. With the efforts of state agricultural department, the seed replacement rate has gone up over the last four years from 10 % to 24.78 % in Paddy and from 10.79% to 29.77% in wheat (Mir 2013). Similar strategy needs to be planned for increasing fruit production in rainfed areas of Jammu. Also, thrust should be given to introduction of latest technology and farm mechanization to reduce the production costs to make the sector more profitable.

Strategies to be followed for increasing fruit production under rain- fed conditions of Jammu subtropics

To stabilize production and win the confidence of orchardists in rain- fed region, work on following aspects is a priority

1. Evaluation of suitable region specific varieties. Some of the promising varieties of different fruit species suitable under rainfed conditions of sub-montane and low hills of Jammu division are being maintained at Rainfed Research Sub-

2. Station for Sub-Tropical Fruits, Raya, Jammu Survey, collection and evaluation of large number of indigenous plant types of economic significance, wild in rainfed areas with special emphasis on drought resistance as well as quality attributes and conservation thereof.
3. Improvement work on ber, bael, wood apple, aonla and annona.
4. Maintenance of directory of lands and location under marginal situation such as dry land, bald hills, hilly terrains etc., with full information about their agro-ecological features. Then evolution of drought resistant crops which perform well under moisture stress conditions and earmarking them for various situations in rain fed regions
5. Generation of information on soil status for optimizing water utilization in rainfed area for fruit crops.
6. Development of efficient water use technology for increased production under rainfed conditions
7. Development of effective plant protection measures against powdery mildew, black spot disease of ber, rust of aonla and insect pests like ber fruit fly and pomegranate butter fly which have become constrains in fruit crop production in this area.
8. Standardization of techniques for faster multiplication of planting material and establishment of nurseries to raise and supply drought tolerant fruits crops plant to prospective growers
9. Developing suitable technologies for reducing post harvest losses and supporting cottage industries based on rainfed fruits



S. No.	Name of fruit plants	Varieties
1.	Citrus:	
	i. Mandarin	Nagpur Santra, Cleoptra mandarin, Kinnow mandarin
	ii. Galpal	
	iii. Sweet lime	
	iv. Eureka lemon	Pine apple, Blood red, Jaffa, Valencia late, Mosambi, Red blush, Duncan, Marsh seed less.
	v. Sweet orange	
	vi. Grapefruit	
2.	Mango	Amarpali, Dusheshari, Bombay green, Langra, Chausa, Fazli, Malika, Totapuri, Baramasi, Kala amb, Jirraiwalla amb, Brota amb, Badda amb, Selection 1, Selection 2, Selection 3, Selection 4, Selection 5, Arun, Varun, Rajiv, Ram kela
3.	Aonla	NA-7, Chakaiya, Banarsi, Kanchan, Desi
4.	Ber	Mecca, Raya Selection, Gola, Small Apple, Ranjri Selection
5.	Guava	Allahabad Safada, L-49, Apple Coloured, Banarsi Surkha, Hybrid-1, Hybrid-2
6.	Bael	NB-5, NB-9
7.	Karonda	Pink yellow, Green pink
8.	Phalsa	Purple round
9.	Tamarind	Saharanpuri, Local

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