



## Tuber Crop Cultivation in *Mewar* Region of Rajasthan: Opportunities and Strategies

The tuber crops are among oldest on earth. In many areas, especially in the wet tropics, they were the only staples and fed extensive populations before the introduction of cereals. Today, they represent the second most important set of food crops in developing countries, closely followed the cereals. They are produced with low inputs but are an important source of income and employment in marginal areas, especially for women. These crop are mostly consumed by the poorest, they contribute greatly to food security and are held in high esteem culturally (Lebot, V., 2009).

Rajasthan extends between 23°3'N to 30°12' North latitudes and 69°30'E to 78°17' East longitudes. In terms of area it is the largest state in India and covers about 3,42,000 sq. km. Rajasthan stretches across two of India's major physiographic divisions, namely the Great Plains (Indian Desert) and the Central Highlands. The Aravalli range of hills intersects the state diagonally from south-west to north-east, extending right up to Delhi. The area lying west of the Aravalli is known as western sandy plains (The Indian Desert) while the area east of the Aravalli falls in the northern part of the Central Highlands. The Aravalli forms the Watershed line between catchment streams flowing into Arabian Sea and Bay of Bengal, respectively. It has a steep but discontinuous front to the *Thar* plains in the west and a relatively gentle slope to the alluvial basins in the north and the east.

The *Mewar* region is lying in the Southern part of Rajasthan. The soils of this part are red in foot hills and alluvials in plains. The average rainfall is 500- 900 mm of this region. Tuber crops have great potential in the agriculture of south Rajasthan due to their high yield potential, ease of cultivation, pest and diseases infestation, importance in starch based industries and presence of bioactive principles which can be used for pharmaceutical industries.

The present study was undertaken to find out opportunity of tuber crops in the Southern part of Rajasthan. The survey was taken up by AICRP on Tuber

Crops in Southern Rajasthan. The data was collected by survey and personal enquiries. The constraints, opportunity and challenges were worked out on the basis of collected data.

Sweet potato, greater yam and *Colocasia* are major tuber crops grown in Rajasthan. Mostly tuber crops are grown in backyard, marginal, waste land, hilly and tribal belts, and on forest land. Sweet potato is grown in 693 ha with a production of 2629 t. and *Colocasia* is grown in 370 ha with the production of 1488 t. (Directorate of Horticulture, 2014). Greater yam, popularly known as *ratalu*, is a major tuber crop grown in south Rajasthan. It is estimated that greater yam is produced in over 1120 ha and estimated production is 9,900 t. District wise area and production is shown in Table 1.

### Present scenario of tuber crops

- Major tuber crops of Rajasthan include sweet potato, *Colocasia* and greater yam.
- Sweet potato is most suitable tuber crop for entire Rajasthan state. It is also successfully grown in Aravalli zone as well as Chambal command areas of the state. It can be concluded that sweet potato can be grown in entire Rajasthan.
- *Colocasia* is an important tuber crop grown by both tribals and non-tribal populations. Previously it was grown in surroundings of major cities and National Capital Territory region of the state. However, due to the industrialization and urbanization, its area was reduced in these places (Alwar, Bharatpur and Jaipur region). At present, *Colocasia* is the choicest tuber crop in *Hadoti* region (eastern Rajasthan in Jhalawar, Kota, Bundi, Baran districts).
- Greater yam is the bread and butter of tribals of south Rajasthan. This has the importance for tribals of south Rajasthan as just like as cassava for Kerala people. Greater yam is grown in Udaipur, Rajasamand, Chittorgarh, Pratapgarh, Banswara, and Dungarpur districts. Both subsistence farming

Table 1: District wise area and production of tuber crops in Rajasthan (2014-15)

District	Sweet potato		Colocasia		Greater Yam*	
	Area	Production	Area	Production	Area	Production
Ajmer	54	70	-	-	-	-
Alwar	8	14	16	8	-	-
Banswara	1	-	-	-	100	800
Baran	-	-	6	5	-	-
Barmer	33	33	-	-	-	-
Bharatpur	12	116	-	-	-	-
Bhilwara	6	10	36	53	25	225
Bikaner	-	-	-	-	-	-
Bundi	44	199	85	395	-	-
Chittore	11	32	13	24	75	600
Churu	-	-	-	-	-	-
Dausa	1	2	-	-	-	-
Dholpur	50	125	95	366	-	-
Dungarpur	-	-	-	-	150	900
Sri Ganganagar	-	-	-	-	-	-
Hanumangarh	-	-	-	-	-	-
Jaipur	33	33	-	-	-	-
Jaisalmer	-	-	-	-	-	-
Jalore	123	246	-	-	-	-
Jhalawar	97	383	-	-	-	-
Jhunjhunu	2	4	-	-	-	-
Jodhpur	39	12	-	-	-	-
Karauli	8	30	-	-	-	-
Kota	-	-	53	496	-	-
Nagaur	73	153	-	-	-	-
Pali	-	-	-	-	-	-
Pratapgarh	3	3	-	-	50	350
Rajasamand	-	-	1	3	300	3300
SawaiMadhopur	1	3	8	24	-	-
Sikar	40	495	-	-	-	-
Sirohi	-	-	-	-	20	125
Tonk	4	16	-	-	-	-
Udaipur	50	650	57	114	400	3600
Total	693	2629	370	1488	1120	9900

Area in ha. Production in tones \*Estimated area as per survey and personal enquiries done in AICRP on Tuber Crops

Source: Department of Horticulture, Pant Krishi Bhawan, Government of Rajasthan

and commercial cultivation is practiced for this tuber crop.

Apart from cassava elephant foot yam is also having great potential for cultivation in south and south east Rajasthan.

#### Constraints

- Presently the major constraint is the availability of quality planting material. As the tuber crops are vegetative propagated, using quality disease free planting material is important to reap good harvest of crops. Besides, tuber crops requires huge amount of mother corms which necessitate huge transportation cost and logistic facilities.
- No released varieties are grown in any of the tuber crops in Rajasthan. In sweet potato, *Colocasia* and greater yam, only local cultivars are used to grow



Fig. 1. Greater yams with red pericarp (Left) and white pericarp (Right)



Fig. 2. Farmers field with staking under sole greater yam cultivation

the crops. These materials are usually infected and low yielding. Before start of the AICRP centre in state, no evaluation trials for assessing yield potential was undertaken.

- Extremity in weather is another factor responsible for the low productivity of tuber crops. Rajasthan state is having highest rainfall variation in the country. It experience drought every three years. Temperature variations also exist. In summers temperature reaches as much as 47-48°C and in winters it is around -1 to -3°C. Frost is another natural vagary. Extreme weather conditions can adversely affect tuber production.
- Anthracnose and dieback is the major disease in Greater yam. It is the single largest hurdle in the production of greater yam. In some of the years, particularly in heavy rainfall years, almost 100 % of the crops were destroyed. Likewise, blight is the major disease in *Colocasia*. Sweet potato is almost free from any major diseases and pests. Elephant foot yam is not grown due to the heavy incidence of *Pythium* rot.
- Postharvest industries in tuber crops do not exist in the state.

#### Opportunities and Strategies

- Standardization of tuber crops production technology is the need of the hour. There is negligible research on tuber crops production technology in Rajasthan. Prior to set up of AICRP Tuber Crops Centre at Udaipur, no recommendation was

available for any of the tuber crop. However, the establishment of AICRP Center on Tuber Crops at Udaipur will go a long way in addressing this concern.

- Recommendation of cultivars for commercial production of tuber crops is also needed. Various germplasm and released cultivars have been tested at Udaipur centre. Due to this, CO-3-4, a white fleshed - sweet potato, Gouri, an orange fleshed- sweet potato, Gajendra, an elephant foot yam, and Mukatkeshi, a released variety of *Colocasia* is now recommended for cultivation in Southern Rajasthan. None of the released cultivars of yams are found suitable for cultivation in southern Rajasthan. Local cultivar is found superior and liked by farmers due to its smoothness, cylindrical shape, moderate weight (1-2 kg per tuber), low acidity and intense red pericarp. Now, its commercial production is taken up.
- In the last few years, area under fruit crops has increased drastically in the state. Tuber crops are most suitable for intercrop in the fruit orchards. Sweet potato, *Colocasia* and yams are recommended as intercrop in new as well as old orchards.
- Efforts should be made to produce sufficient quality planting material through FPTD (Farmers Participatory Technology Development) and involving progressive farmers, KVK's and NGO's. The efforts has been initiated in this direction and a project entitled "Improving productivity of tuber crops through farmer participatory approach" is launched in 2015-16 under RKVY Scheme with the technological backup of AICRP on Tuber Crops, Udaipur Centre. It aims to generate *elite* planting material of greater yam, *Colocasia* and Sweet potato for 625 ha.in a year.

- Awareness campaigns and intensive training programmes should be organized for addressing region specific disease problems such as anthracnose in greater yam and weevil in sweet potato.
- The value added processing units should be established in area for round the year availability of tuber crops.

<sup>1&3</sup>Maharana Pratap University of Agriculture and Technology, Udaipur 313 001, Rajasthan

<sup>2</sup>National Institute of Food Technology Entrepreneurship and Management, Sonapat 131 028, Haryana, India

<sup>4</sup>ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvanthapuram 695 017, Kerala, India

Corresponding author: R.S. Rathore

e-mail: drrathorers@gmail.com

Received: 28 November 2016

Accepted: 24 December 2016

## References

- Directorate of Horticulture. 2013. Horticulture Statistics. Directorate of Horticulture, Pant Krishi Bhawan, Government of Rajasthan, Jaipur.
- Lebot, V. (2009). Tropical Root and Tuber Crops: Cassava, Sweet Potato, Yams, Aroids. *CABI*, UK. pp. 1-413.

R.S. Rathore<sup>1</sup>  
Sunil Pareek<sup>2</sup>  
Manish Kalal<sup>3</sup>  
James George<sup>4</sup>