

Field Day cum Agripreneur Meet

Field Day cum Agripreneur Meet on Chinese potato was organized at Alvan Thulukapatti, Tirunelveli district on 11 January 2019 to celebrate the success of demonstrations on improved variety of Chinese potato (Fig. 9). The farmers were imparted training on scientific cultivation and were explained about the superiority of Sree Dhara over local varieties. About 100 farmers and entrepreneurs participated in the event.



Fig. 9. Field day on Chinese potato at Alvan Thulukapatti

Harvested tubers were distributed to the neighbouring farmers for establishing seed villages for meeting the demands of good quality planting materials of improved variety 'Sree Dhara' (Fig.10) in the village.



Fig. 10. Harvesting and distribution of tubers of Chinese potato (Sree Dhara)

Feedback from farmers: The improved variety is high yielding, good shape and size of tubers, more number of tubers/plant, good keeping quality, high demand among traders/consumers, fetches remunerative price, nutrient efficient, drought tolerant and short duration (4 months).

Challenges: Lack of availability of good quality planting materials of improved varieties, incidence of nematode, pests and diseases, price fluctuation, lack of pre and post harvest machineries, absence of organized marketing system and wild animals attack.

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Farmer Participatory Demonstrations of Improved Technologies of Tropical Tuber Crops – A Success Story

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By

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Fertilizer Best Management Practices in Elephant Foot Yam

Ten frontline demonstrations on Fertilizer Best Management Practices (FBMP) in elephant foot yam was laid out in East Godavari and West Godavari districts of Andhra Pradesh during 2019 (Fig.11). The FBMP includes soil application of zone specific customized plant nutrient formulation and foliar application of micronutrients. Soil samples were collected from all the demonstration plots and technological interventions are being done based on soil test data. Farmers are supplied with critical inputs for enhancing the profitability through Fertilizer Best Management Practices.



Fig. 11. View of demonstration plots on Fertilizer Best Management Practices in elephant foot yam

Conclusion

Farmer participatory research cum demonstrations (60 nos.) conducted in an area of 12 ha have revealed that improved varieties and technologies of tuber crops have led to significant improvement in the productivity of tuber crops. Hence, development efforts by various research and development organizations are need to be strengthened towards participatory research cum demonstrations for improving the productivity and profitability of tuber crops. Effective linkage is to be established among different research, extension agencies and tuber crops growers through well coordinated participatory research/extension. The results clearly proved that participatory approaches are the need of the hour to make the farming more profitable and sustainable.

Preamble

Tropical tuber crops viz., cassava, sweet potato, yams, elephant foot yam, taro, tannia, Chinese potato, yam bean etc. play an important role in food and nutrition security of the global population, especially the small and marginal farmers and the tribal community. Tuber crops are known for their climate resilience and are also rich in calorie, dietary fibre, vitamins and antioxidants. India is one of the major producers of tuber crops which are mainly cultivated in the states of Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Karnataka, Maharashtra, Bihar, West Bengal, Uttar Pradesh and North Eastern states. Technological innovations and diffusion of new technologies are the key drivers to enhance the productivity and profitability of tuber crops farming. Through the systematic research conducted at ICAR-CTCRI and SAUs during the last fifty five years, many technologies were developed both in production and processing of tuber crops. Various programmes are implemented by research and development institutions to disseminate the research results among the farmers. The extent of adoption of improved technologies of tuber crops by the farmers is comparatively low due to various constraints including technological, management, marketing and socio-economic factors. Hence, participatory demonstrations have been attempted through action research with farmers' participation in 60 farmers' fields of Tamil Nadu, Karnataka and Andhra Pradesh for enhancing technology adoption by tuber crops growers.

Objectives

- To establish demonstration plots of improved technologies of tuber crops
- To analyze the technical feasibility and economic viability of improved technologies of tuber crops
- To conduct farmer participatory transfer of technology programmes

Partners

- Tuber crops growers
- Scientists/Staff members of ICAR-CTCRI
- Krishi Vigyan Kendras
- State Department of Agriculture/Horticulture
- Media-Press, Journals and Video for creating awareness

Capacity building and facilitation of resources

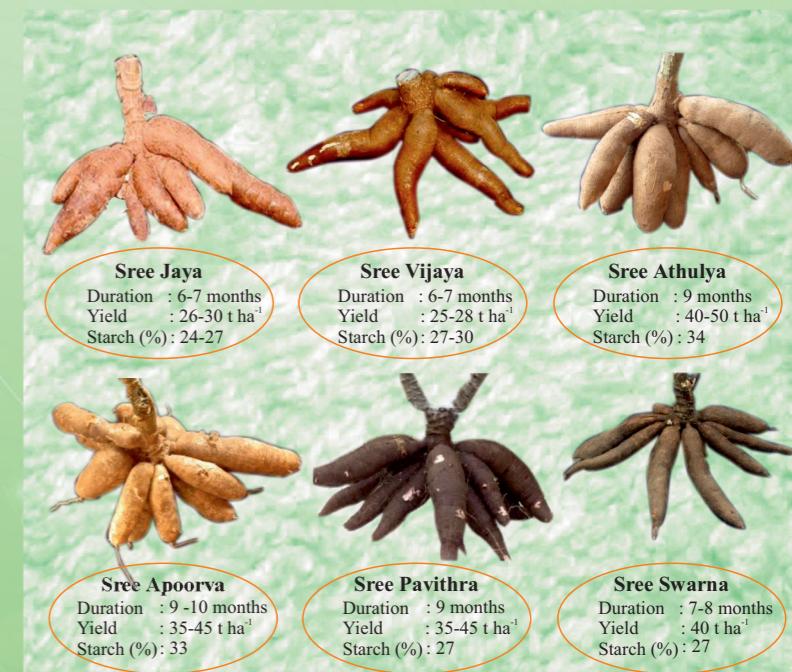
Farmers who had interest in taking up scientific interventions were selected with the help of Krishi Vigyan Kendras and State Department of Agriculture/Horticulture by following the principles of participatory demonstration. Improved varieties of tuber crops and Fertilizer Best Management Practices (FBMP) were demonstrated in different states viz., Tamil Nadu, Karnataka and Andhra Pradesh for proving its technical feasibility and economic viability to the farmers. Demonstrations were conducted by multidisciplinary team from ICAR-CTCRI comprising scientists, technical and skilled support staff.

Quality planting materials of improved varieties and critical inputs were supplied to the farmers for establishing demonstration plots. Farmers were trained on improved technologies of tuber crops. Frequent farm advisory visits were also taken up by the scientists to monitor the growth and yield performance.

Technologies for demonstrations

Technologies covering high yielding varieties of cassava, sweet potato, Chinese potato and Fertilizer Best Management Practices in elephant foot yam were demonstrated in the states of Tamil Nadu, Karnataka and Andhra Pradesh. The details of the selected improved varieties and technologies are given below.

Improved varieties of cassava





Fertilizer Best Management Practices

Site Specific Nutrient Management (SSNM): Customized plant nutrients formulation containing major, secondary and micronutrients was developed for different zones based on SSNM technology which has a potential to increase corm yield by 20-27.5 % in elephant foot yam.

Liquid/foliar micronutrient formulation: Micronol is recommended @ 5 ml per litre of water for foliar spray for managing micronutrient deficiencies and for enhancing yield in elephant foot yam by 5-9%. Technology for its production has been commercialized to M/S. Linga Chemicals, Madurai, Tamil Nadu.

Technological Interventions

Improved varieties of cassava

Frontline demonstrations of improved varieties of cassava (10 nos.) were conducted in Kanyakumari district of Tamil Nadu during 2017-18 (Fig. 1). Sree Pavithra produced the maximum yield (36 t ha⁻¹) followed by Sree Jaya (35 t ha⁻¹), Sree Swarna (33 t ha⁻¹) and Sree Vijaya (32.5 t ha⁻¹). Average productivity of cassava from improved varieties was found to be 34.12 t ha⁻¹ which is greater than that of the local varieties by 17.7 %.



Fig. 1. View of demonstration plots of improved varieties of cassava

Economic impact of improved varieties of cassava

Table 1. Economic impact of improved varieties of cassava

Variety	Yield (t ha ⁻¹)	Gross Income (₹ ha ⁻¹)	Total Cost (₹ ha ⁻¹)	Net Income (₹ ha ⁻¹)	B: C ratio
Improved varieties*	34.12	2,73,000	79,650	1,93,350	3.43
Local varieties	29.00	2,32,000	75,495	1,56,505	3.06

* Sree Jaya, Sree Vijaya, Sree Pavithra and Sree Swarna

Gross income realized from improved varieties and local varieties of cassava were ₹ 2.73 lakhs ha⁻¹ and 2.32 lakhs ha⁻¹ respectively (Table 1). Net Income of ₹ 1.93 lakhs (B:C ratio:3.43) was obtained from improved varieties whereas, it was ₹ 1.56 lakhs from local varieties (B:C ratio:3.06).

In the second phase, fifteen Frontline demonstrations on improved varieties of cassava viz., Sree Jaya, Sree Vijaya, Sree Swarna, Sree Pavithra, Sree Athulya and Sree Apoorva were established in Kanyakumari, Salem and Namakkal districts of Tamil Nadu during 2018-19 (Fig. 2).



Fig. 2. View of demonstration plots on improved varieties of cassava
Frontline demonstrations on improved varieties of cassava conducted in three districts viz., Kanyakumari, Salem and Namakkal districts of Tamil Nadu revealed that Sree Athulya recorded the highest yield (39.25 t ha⁻¹) followed by Sree Pavithra (36.50), Sree Apoorva (36.25), Sree Swarna (34.50), Sree Jaya (33.50) and Sree Vijaya (32.08). Productivity of cassava from improved varieties was found to be 35.35 t ha⁻¹ which was higher (17.43 %) than the local varieties yield of 30.10 t ha⁻¹ (Fig. 3).

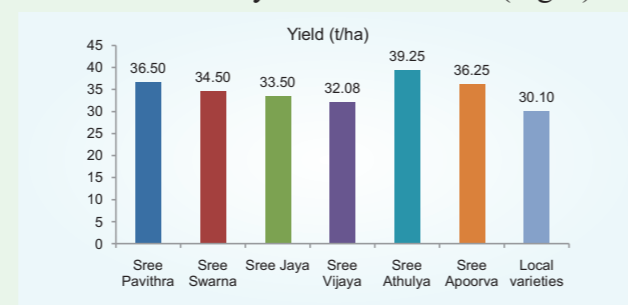


Fig. 3. Productivity of improved varieties of cassava in comparison to local varieties

Economic impact of improved varieties of cassava
Gross income realized from improved varieties of cassava in Kanyakumari, Salem and Namakkal districts was ₹ 2.37 lakhs in comparison to ₹ 2.0 lakhs obtained from local varieties. Net Income of ₹ 1.27 lakhs (B:C ratio:2.18) was obtained from improved varieties whereas, it was ₹ 1.01 lakhs from local varieties (B:C ratio:2) (Fig. 4).

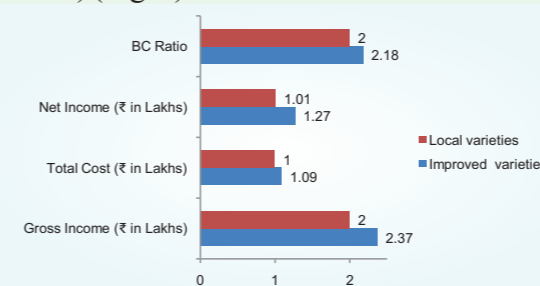


Fig. 4. Economic impact of improved varieties of cassava in comparison to local varieties

Feedback from farmers: The improved varieties are high yielding, good shape and size of tubers, more number of tubers/plant, good keeping quality, high starch content, high demand among traders/consumers, nutrient efficient and drought tolerant.

Challenges: Non availability of skilled labour, lack of availability of quality planting materials of improved varieties, price fluctuation, lack of knowledge on value addition, non availability of quality inputs, water shortage, incidence of pests and diseases and attack by wild animals were the major challenges experienced by the cassava growers of Tamil Nadu.

Improved varieties of sweet potato

Twenty demonstrations on improved varieties of sweet potato viz., Sree Arun, Sree Nandini and Sree Bhadra were conducted in Belagavi district of Karnataka during 2017-18 (Fig. 5).



Fig. 5. View of demonstration plots of improved varieties of sweet potato

Sree Arun produced the maximum yield (27 t ha⁻¹) followed by Sree Bhadra (20 t ha⁻¹) and Sree Nandini (19 t ha⁻¹). Average yield of improved varieties of sweet potato was found to be 21.3 t ha⁻¹ which was (9.2%) greater than the yield of local varieties (19.5 t ha⁻¹) (Fig. 6).

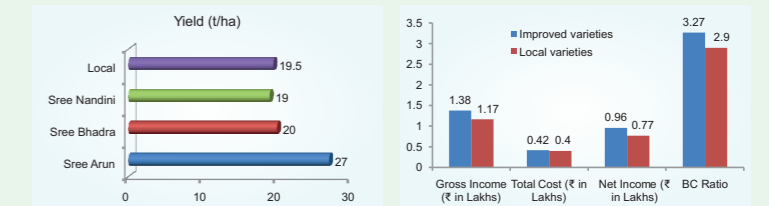


Fig. 6. Yield of improved varieties of Sweet Potato
Fig. 7. Economic impact of improved varieties of sweet potato

Gross income realized from improved and local varieties of sweet potato were ₹ 1.38 and 1.17 lakhs ha⁻¹ respectively (Table 5). Net Income of ₹ 0.96 lakhs (B:C ratio:3.27) was obtained from improved varieties whereas it was ₹ 0.77 lakhs from local varieties (B:C ratio: 2.9) (Fig.7).

Feedback from farmers: The improved varieties are high yielding, good shape and size of tubers, more number of tubers/plant, nutrient efficient and drought tolerant.

Challenges: Incidence of pests and diseases, weather aberrations/erratic rainfall, price fluctuation, high marketing cost, long distance to the APMC market and lack of access to processing units.

Improved variety of Chinese potato

Five demonstrations on improved variety of Chinese potato viz., Sree Dhara were conducted at Alvan Thulukapatti in Tirunelveli district of Tamil Nadu during 2018-19 (Fig. 8).



Fig. 8. View of demonstration plots of Chinese potato (Sree Dhara)

Yield of Sree Dhara was found to be 26.7 t ha⁻¹ which was 16.6 % higher than the yield of local varieties (22.9 t ha⁻¹). Gross income realized from Sree Dhara was ₹ 2.80 lakhs while for local varieties it was ₹ 2.40 lakhs (Table 2). The productivity and profitability of Chinese potato significantly increased with the improved variety.

Table 2. Economic impact of improved variety of Chinese potato (Sree Dhara)

Variety	Yield (t ha ⁻¹)	Gross Income (₹ ha ⁻¹)	Total Cost (₹ ha ⁻¹)	Net Income (₹ ha ⁻¹)	B: C ratio
Sree Dhara	26.7	2,80,350	1,01,290	1,79,060	2.77
Local varieties	22.9	2,40,450	97,660	1,42,790	2.46