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Current Status of Cassava in Maharashtra

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Abstract

In Maharashtra cassava cultivation started near Baramati region in Pune district and the adjoining districts of Satara and Sangli two and a half decades ago. Presently its cultivation is mainly concentrated in the districts of Nashik, Ahmednagar, Beed, Latur, Sholapur and Satara in about 250 ha. Cassava processing also started during the same period with the establishment of sago factories in these regions. The high yielding cassava variety released from Central Tuber Crops Research Institute, H-226, is the only variety widely cultivated in this state. The crop is raised under heavy black cotton soil that is alkaline (pH 8.23) in nature with medium organic C, low available N and high available P and K. Amongst the micronutrients, Fe was observed to be deficient as reflected by the lime induced iron chlorosis in some parts. The farmers did not follow scientific cultivation practices and other agro-techniques like irrigation. The crop is irrigated till harvest as in the case of sugarcane, which induced more of shoot growth at the expense of tuber yield. The average tuber yield obtained was about 10-12 t ha^{-1} which could be enhanced to 50 t ha^{-1} with proper agro-techniques. The entire production was being utilized for sago making with an average starch recovery of 15-17% only. Untimely planting in view of rainfall pattern (rains received during June-October), improper method of planting, imbalanced nutrient and water management and lack of sound knowledge on cultivation techniques were found to be the main reasons for poor tuber yield of cassava in Maharashtra. In the industrial front, raw material shortage, high power consumption, lack of policy support etc. were the major constraints. The situation warrants the need for strong technological back up both in the cultivation as well utilization along with suitable policy, so that cassava can have a great scope in the non-traditional state of Maharashtra.

Key words: Cassava, status, cultivation, processing, Maharashtra

Introduction

Cassava popularly referred to as tapioca in India is a tuber crop looked upon as an alternate source of food or a 'future crop' due to its energy value. Introduced from Brazil, its centre of origin, into India by the Portuguese, cassava strongly established its roots in the states of Kerala, Tamil Nadu and Andhra Pradesh. While major portion of the tubers produced in Kerala goes for direct human consumption as a secondary staple food, in the other two states it is used as a raw material for starch production, next only to corn. IFPRI (2001) estimated a projected demand of 55% increase for roots and tubers in the developing world during 1997 - 2020, particularly an increase of 49% for cassava. Srinivas (2007) reported that the projected demand for cassava starch is predominantly in the adhesive sector and the projected demand-supply gap in the industrial sector is expected to be 1.5 x 10^6 t of cassava tubers requiring another 750000 ha to be brought under cassava cultivation in India. This warrants the need for area expansion of cassava in the non-traditional cassava growing states. In this regard, the state of Maharashtra, the major consumer of sago made from cassava starch offers great scope for bringing new areas under this crop. During 1980s, efforts were made to take up cassava cultivation in Maharashtra and side by side sago industries have also been established in places like Baramati, Satara etc. In view of the potential of cassava in a non-traditional state like Maharashtra, there is a need to assess the current status of the crop, its cultivation and utilization pattern and the associated

constraints so as to devise effective promotion strategies. Hence, the present investigation was taken up with the objective of documenting the current status of cassava in Maharashtra.

Materials and Methods

The major cassava growing districts in Maharashtra state were identified based on discussion with the officials of Department of Agriculture, Maharashtra, promising industrialists and the scanty data available on area and production of cassava in this state. The districts Nashik, Beed, Latur, Sholapur and Satara were thus selected purposefully for the study. Extensive field visits (numbering two each per above districts) were undertaken to cassava fields and cassava based industries to collect first hand information on the crop in the state. In addition, participatory rural appraisal (PRA) techniques such as key informant interview, focused group discussion etc. were employed to get detailed information on the cultivation and utilization aspects of cassava in Maharashtra. The data collected were analysed statistically using descriptive statistics.

Results and Discussion

There are reports of cassava cultivation and establishment of processing plants in Maharashtra state in the 1970s, particularly in Kolhapur and Satata districts (Patil,1971; Bhavani Sabudana Industries, 1974). During late 1980s, intensive cassava cultivation started near Baramati in the erstwhile Pune district. The main idea behind these moves was to locally produce the sago (sabudana), the most sought after food item in the state, especially during fasting. Sago is usually purchased from Tamil Nadu through merchants. Deshmukh et al. (1977) evaluated the performance of cassava varieties in Maharashtra and concluded that cassava could be successfully grown under hot and dry climate of Central India with irrigation and protection from hot winds. Likewise, the Konkan region of Maharashtra with hot and humid climatic conditions was also found congenial for cassava cultivation with supplementary irrigation during dry period (Salvi et al., 1984). Field visits undertaken by scientists from Central Tuber Crops Research Institute (CTCRI) in 2005 to Baramati revealed the prevalence of cassava cultivation in and around Baramati in about 40 ha, with H-226 brought from Tamil Nadu as the only variety grown. However, it was observed that the sago factories established there were shut down mainly due to shortage of cassava tubers in sufficient quantities.

The present study indicated that cassava cultivation at present is mostly concentrated in the districts of Nashik, Ahmednagar, Beed, Latur, Sholapur and Satara in Maharashtra. The cassava hybrid variety, H-226 released from CTCRI was cultivated in 250 ha in these districts. The whole quantity of tubers produced was used for sago production and currently there were only two sago factories operating in Maharashtra, one each in Nashik and Beed districts. The rest of the industries established in other parts of the state have been closed down due to shortage of raw materials.

Cassava production system in Maharashtra

As an irrigated crop, cassava was raised under heavy black cotton soils that are alkaline (pH 8.23) in reaction. The results of analysis of the soil samples collected from these districts are given in Table 1.

Table 1. Chemical properties of the soil of cassava growing regions of Maharashtra

Soil property	Unit	Optimum requirement	Present status	Rating
pH	%	4.5-7.5	8.23	Alkaline
Organic carbon		0.75	0.51	Medium
Available N	kg ha^{-1}	350.00	92.80	Low
Available P	,,	20.00	27.56	High
Available K	,,	250.00	565.04	High
Micronutrients				
Cu	$\mu g\ g^{-1}$	2.00	2.31	Optimum
Fe	,,	6.00	1.01	Deficient
Zn	,,	1.50	14.66	High
Mn	,,	8.00	30.69	High

Using the planting material of cassava obtained from Salem region, Tamil Nadu, setts of 15-20 cm length were planted mainly during September-October. Sett treatment was in vogue, wherein the setts were dipped in carbendazim (2ml l^{-1}.) or mancozeb (2g l^{-1}.) solution for 15-20 min before planting. Some farmers treated the setts in dimethoate solution also before planting.The treated setts were

planted on ridges at a spacing of 90 x 90 cm. Since the farmers possessed rich knowledge on sugarcane cultivation, they planted the setts at the bottom of the ridges instead on the top as in the case of sugarcane. This is a clear indication of the lack of knowledge on scientific cultivation of cassava by the farmers. In the case of nutrient management, the farmers applied heavy doses of nutrients considering the status of available nutrients based on soil test. Farmyard manure (FYM), diammoniumphosphate (DAP) and single super phosphate (SSP) were applied as basal dose. The quantities applied were: FYM @ 3-10 t ha^{-1}, N @ 23 kg ha^{-1} and P_2O_5@ 63 kg ha^{-1}. Top dressing was done twice, first during 30-45 days after planting and the next 75-90 days after planting. Generally urea, DAP and muriate of potash (MOP) were used and the quantities applied in terms of nutrient content were:N @ 80-100 kg ha^{-1}, P_2O_5@ 65-100 kg $ha^{-1}$and K_2O @ 65-75 kg ha^{-1}. The total amounts of nutrients applied were estimated to be: N @ 103-123 kg ha^{-1}, P_2O_5@128-163 kg ha^{-1} and K_2O @ 65-75 kg ha^{-1}. As the available P and K status of the soil was high, the quantities of nutrients applied seemed to be on the higher side. With respect to FYM and N, adequate quantity was applied. Overall, it was observed that the farmers were ignorant of the nutrient requirement of cassava and applied fertilizers injudiciously. Interculturing was carried out thrice, first during 30-45 days after planting and then twice at monthly intervals. During the first interculturing, only two opposite shoots were retained. The farmers irrigated cassava similar to that of sugarcane. The first irrigation was given at planting followed by subsequent two irrigations at 3-5 days interval and thereafter once in 10-15 days till harvest. The crop also exhibited lime induced Fe chlorosis in some patches, since there was Fe deficiency in the soil as observed in Tamil Nadu. With regard to plant protection measures, there was hardly any report of pests and diseases and there was no chemical spraying. Nevertheless, white fly incidence was observed rarely and mosaic was noticed in very few plants. The crop was harvested 10-12 months after planting using either tractor or man power and the yield obtained was about 10-12 t ha^{-1}

A critical analysis of the cassava production system in Maharashtra revealed that the farmers, in general, were ignorant of the cassava crop and possessed a shallow knowledge on the advanced production technology. It is more so in the case of nutrient and water management of the crop. They had sound knowledge on sugarcane cultivation and applied their sugarcane experience to cassava. The incorrect adoption of nutrient and water management practices resulted in luxurious shoot growth at the expense of tuber growth. That may be the reason for the poor tuber yield of cassava obtained by the farmers. The situation warrants organizing strong and effective technology transfer programme to educate the farmers on scientific cultivation of cassava.

Cassava utilization system in Maharashtra

The major portion of the cassava produced in Maharashtra was utilized by the industries for producing sago. Though cassava processing started in Baramati, Satara, Yuwatmal etc. more than three decades ago, presently most of the units are closed due to shortage of raw materials; currently only two units are in operation, one each at Nashik and Beed. Though the installed capacities of these factories are 80-100 t day^{-1}, they process only 15-20 t day^{-1} during 75-90 days in a year due to shortage of planting materials. The starch recovery is also observed to be low, in the range of 15-17% only. Raw material shortage is the major problem faced by these units. The majority of the operations in these two units were mechanised and only seven labourers for starch extraction and 20 for sago manufacture were employed. The important machineries of these industries included tuber cleaning assembly consisting of washing tanks, cutter, elevator, peeler etc., rasping (3 nos.) and sieving assembly, settling tanks, drying yards etc. Globulators, graders and polishing unit are the major parts of the sago manufacturing unit. Electricity is the sole source of power used for the entire operation of sago making and it was observed that around 115-120 hp power was used for this process which was on the higher side. Even in Tamil Nadu, where industrial utilization of cassava was well established, Shaji and Kamaraj (2003) observed that cassava processing industries were energy intensive with major shares supplied as electrical energy and firewood. The total energy input for both super fine and pearl sago was estimated to be 6070 MJ per ton of tuber processed with fire wood accounting for 67% of energy required for sago production and electricity 30%. They suggested modernization of equipment and processes to improve

energy efficiency. The cassava industries in Maharashtra that were in the infant stage should take lessons from Tamil Nadu and adopt appropriate measures to achieve energy efficiency in their factories. The present capacity utilization of the industries that was only about 20% of the full installed capacity, indicated a mismatch between tuber production and its utilization. The industries have been established with a high crushing capacity without taking stock of the current tuber production. The zeal and enthusiasm shown in starting the industries has not been extended in augmenting cassava production. As a consequence, there was not much progress in the area under cassava in Maharashtra resulting in shortage of raw material for the industries and ultimately many of the units that were started earlier have been closed down.

Conclusion

Maharashtra state was rather a non-traditional belt for cassava and the cultivation of this crop was initiated just about three decades ago. There were sporadic attempts in the past to grow cassava in different regions; however, at present the cultivation is mostly confined to the districts of Nashik, Ahmednagar, Beed, Latur, Sholapur and Satara. The farmers were observed to cultivate this crop in an improper way without possessing a sound knowledge on the crop and its scientific cultivation practices. This is more evidenced in the case of nutrient and water management leading to poor tuber yields. The case of utilization was nothing different from cultivation. Though the installed capacities of these factories are 80-100 t day^{-1}, they process only 15-20 t day^{-1} during 75-90 days in a year due to shortage of planting materials. Raw material shortage was the major problem faced by these units. In addition, the power consumption by these units was observed to be on the higher side. As a consequence, majority of the factories have been closed down and currently only two were in operation. Large scale awareness programme to impart scientific cultivation techniques to farmers, augmenting cassava production in suitable districts and linking it with factories, rationalization of power consumption in sago units with an appropriate policy support were essential to tap the full potential of cassava in Maharashtra.

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