INTRODUCTION

Tuber and root crops are important cultivated staple food, third to cereals and grain legumes, grown in tropical and sub-tropical regions of the globe. The crops in this group feed over one billion people of the developing world and thus have utmost importance for the world food programme. The most realistic estimates of food demand by 2050, considering changes in diets and population growth indicates that daily caloric requirements will increase by about 70 per cent (Tittonell, 2013). There is a doubt to fulfill this demand by cereals and grain legumes whereas, root and tuber crops have ability to bridge this gap as they have capacity to yield more per unit area. In the context of changing climate and its inevitable consequences in the agriculture scenario of the country, the relevance of root and tuber crops is very high. The most important tropical tuber crops in India are cassava, sweet potato, yams (Greater yam, White yam, Lesser yam etc.), elephant foot yam, colocasia, tannia and some other minor tuber crops.

PROBLEMS

Availability of healthy planting material

Majority of the root and tuber crops are vegetatively propagated crops and mass multiplication of healthy planting material in short period is a major hindrance in increasing the area of cultivation for these crops.

Water logging

Economic product of these crops are produced underground, one cannot cultivate these crops in low lying area or the area where water logging is a common feature or the soils having more water holding capacity because these crops cannot yield better in anaerobic condition.

Early or late sprouting

Most of these crops required dormancy of certain period. Knowledge on breaking of this dormancy for early
planting or delaying in dormancy for late planting on need bases, is lacking because these crops are most neglected crops and research work on various aspects is lacking. Unwanted sprouting in storage condition is a serious problem.

Pest and diseases

Though pest and diseases is not the major problem of South Gujarat but some of the pest or disease can drastically lower the yield. In cassava, cassava mosaic disease is very common in southern states of India. If the crop is infected in initial stage of growth, the heavy loss in yield was reported but if the crop is infected in later stage of growth yield loss reported is marginal. In elephant foot yam collar rot and leaf blight is a major problem and can drastically lower the yield. In case of greater yam, if spores of anthracnose fungus get congenial environment it infests heavily and yield loss may be up to 80 per cent. Sweet potato weevil is another (SPW) most dangerous pest of sweet potato which can ruin 100 per cent crop, if timely control measures are not taken.

PROSPECTS

Climate resilient

AICRPTC covers 18 states and 1 union territory of the country and hence has the ideal situation to conduct studies in different Agro climatic situations. Tuber Crops have the distinct trait of climate change resilience, which needs to be tapped so that the likely shortage in food grain production globally could be easily addressed. These centres successfully grow different tuber crops in different season and in a different climatic condition prove that root and tuber crops are climate resilient crops that can be helpful in changing climate scenario.

Most efficient converter of solar energy

Tuber and root crops possess high photosynthetic ability and are recognized as the most efficient in converting solar energy, cassava producing $250 \times 10^3$ kcal ha$^{-1}$ and sweet potato $240 \times 10^3$ kcal ha$^{-1}$, as compared to $176 \times 10^3$ kcal ha$^{-1}$ for rice, $110 \times 10^3$ kcal ha$^{-1}$ for wheat and $200 \times 10^3$ kcal ha$^{-1}$ for maize; hence the tropical root crops are known to supply cheap source of energy (Suja, 2014).

Yields high with low nutrients

Tuber and root crops have capacity to yield high even under poor and marginal soils. Though the root and tuber crops produce more yields per unit area than the cereals, the recommended fertilizer doses are very low. The average production of root and tuber crops is about 25 to 30 t/ha, whereas average production of cereals is about 3 to 6 t/ha. The recommended fertilizer dose of cassava is 100:50:100 NPK kg/ha, sweet potato is 75:50:75 NPK kg/ha, greater yam is 80:60:80 NPK kg/ha, elephant foot yam is 150:60:150 NPK kg/ha whereas the recommended fertilizer dose of rice is 100:50:00 NPK kg/ha, wheat 120:60:00, sorghum 80:40:00 NPK kg/ha.

Cash crops

Now a days, the crops like elephant foot yam, sweet potato etc. are considered as a cash crop and with its high yielding capacity per unit area, they are more beneficial to uplift the socio – economic condition of small and marginal tribal farmers of South Gujarat region. Moreover, the crops like elephant foot yam, greater yam and lesser yam can be harvest prematurely or they can be harvest late after attaining maturity and can be kept as such in the soil for some time, depending upon market glut and prices. Tannia can be grown as an inter crop in wide spaced crops like fruit orchards and is considered as the most remunerative crop of our area.

Can be grown on poor and undulated land

As discuss above these crops requires low nutrients and most of them are cultivated as a rainfed crops in southern, eastern and north-eastern states, mostly on undulated land by tribal population where monsoon last for longer period.

Nedunchezhiyan and Misra (2013) identified six sweet potato lines viz. ST-14, CIP SWA-2, 420027, Gouri, ST-13 and SB 198/115 through NaCl mediated hydroponics and in vitro methods for tolerance to salinity (6-8.0 dSm$^{-1}$). Filed screening trials for salinity tolerance indicated that the sweet potato genotypes viz. CIP SWA-2, ST-14, Gouri, SB 198/115, CIP-440038 (Bhukanti) and released varieties like Pusa Safed, Sree Bhadra and Samrat can also give reasonably higher yield in the saline affected coastal areas of Odisha.

Provide raw material for industries and value added products

Besides they have potential as sources of alcohol, number of value added products are being made from different tuber crops. Starch, Sago, chips and parboiled chips, flour for confectioneries and biscuits etc., cattle-swine- aqua feed, adhesives, ethanol, thippi, biodegradable plastic can be made from cassava tubers while, bio-pesticides can be made from cassava tender leaves. Besides, noodles, candy and flour made from sweet potato, it is an important source of starch, glucose, sugar syrup and industrial alcohol. “Patra” is the most popular value added product of Gujarat, Maharashtra and Goa made, from the leaves of tannia and is earning foreign currency by exporting this product.
Pragmatic Perspectives of Agricultural Development Programmes in Present Scenario

FUTURE PROSPECTS

Expansion of the area

Crops like cassava, elephant foot yam and sweet potato were grown for testing at coconut farm, Ta.: Mahuva, Dist.: Bhavnagar in collaboration with JAU and NGO run by Pidilite Industries Limited, Ahemdabad, Gujarat. All the crops tested gave enthusiastic results. Now NGO of Pidilite Industries Limited is planning to establish cassava based industries in that non-traditional area for tuber crops. They have planted 4000 cuttings of cassava cv. Pavithra at Village: Bhanavav, Ta.: Mahuva Dist.: Bhavnagar as a demonstration. This year 500 cuttings of cassava cv. IGT-5 were given to the farmer of Visnagar in North Gujarat on a trial base.

Many of the progressive farmers had grown greater yam under naturally ventilated polyhouse and got excellent results. On those bases, greater yam can be promoted as high value crop for naturally ventilated poly houses.

REFERENCES


