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Case Study

BRINGING PROSPERITY TO POTATO GROWERS THROUGH TRUE POTATO SEED (TPS) CULTIVATION: A CASE OF KHOWAI DISTRICT OF TRIPURA

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ABSTRACT

The major constraints of potato production in Tripura are non availability of quality seed tuber, incidence of potato diseases mainly late blight and viruses etc. TPS could be an alternative technology to increase productivity and reduce the cost of potato production. TPS in place of traditional seed tubers offer several advantages. Only 100 g TPS is needed for one ha as compared to nearly 2-2.5 tones of seed tubers required to plant the same area. Raising potato crops through TPS has been found to be highly remunerative to the potato growers. Farmers are not getting optimum assured profit due to lack of sufficient knowledge with respect to plant protection measures. It is utmost necessary to guide the TPS growers through continuous training on plant protection measures to get optimum yield per unit area by effective management against pests and diseases.

Introduction

The North Eastern Hill (NEH) region constitutes around 10% of the total geographical area in India. This region has about 10% of the country's total potato area (Anonymous, 2005). Compared to national average of 18.2 t/ ha, potato yield in the NE states except Tripura (19.7 t/ha) has been all time low (4.2- 8.3 t/ha) (FIB, 2008). The low potato yield in the NEH region could be attributed to many factors. The main reasons for the low potato yields are adequate and untimely availability of essential crop inputs like healthy seed, fertilizers, pesticides etc. coupled with poor management practices followed by the growers. Prevalence of serious diseases like late blight, brown rot/ bacterial wilt, etc., is also responsible for low productivity in the region (Singh *et al.*, 2003).

Potato cultivation in Tripura was introduced during the regime of Maharaj Bir Bikram Kishore Manikya Bahadur (1923-1947). During that period, *'Phulwa,'* an indigenous cultivar of potato was popularly grown in the state and was known as *Tippera* or *Comella deshi* to the farmers. It was characterized by small to medium size, white colour, smooth skin, round shape and yellow flesh. The characteristic feature of good keeping quality and high temperature storage resistance allowed the cultivators to store their produced stock in local conditions. After independence, some more indigenous varieties like *'Lal alu'*, also known as *'Pahari alu'* and *'Lal deshi', 'desi sada guri alu', 'deshi lal guri alu'* etc. were brought under cultivation in the state. The tubers of these rough skinned local cultivars were medium in size, red in colour, round in shape and yellow in flesh. The varieties were usually susceptible to mosaic and late blight diseases. During 1960s, some new varieties namely, *Royal kidney*, *President*, *Magnum Bomum* and *Great Scot* were introduced in the state but those did not gain much popularity among potato growers. With state and central government initiatives, gradually a number of new varieties started getting introduced and

cultivated in the state, e.g., during 1970s and 80s *Kufri Jyoti, Kufri Sinduri, Kufri Chandramukhi, Kufri Jeevan, Kufri Badshah* etc. were introduced. Till date *Kufri Jyoti* is the only variety largely accepted by the potato growers of Tripura. *Kufri Chandramukhi* is also popular as a short duration variety and for its good taste. The potato production technology was standardized during the 1980s in the state and in the same decade True Potato Seed (TPS) was also introduced in Tripura, although the possibility of raising commercial crop from TPS was first explored in India in late 1940s. The attempt, however was not successful as the efforts were mainly directed to use self-seeds of the cultivar '*Phulwa'* that flowers naturally under short days when potato crop is grown in plains. The produce of this population was highly heterogeneous for most of the economic characters and also had low yields due to inbreeding depression. Commercial production and utilization of TPS in large scale started only during the 1990s (Paul *et al*., 2015).

Potato is the most remunerative cash crop of Tripura being cultivated in an area of 6905 ha with production of 1.23 lakh tones. The major constraints of potato production in Tripura are non availability of quality seed tuber, incidences of potato diseases mainly late blight and viruses etc. Certified quality seed tubers often brought from outside the state is expensive, perishable, bulky and difficult to transport to distance areas hence, potato demands a heavy investment. The potato farmers in Tripura are therefore compelled to use low quality seed tubers either available in the market at a cheaper rate or produced by them over several generations using the same seed stock. In Tripura, TPS could be an alternative technology to increase productivity and reduce the cost of potato production. TPS in place of traditional seed tubers offers several advantages- – TPS is a low cost planting material and is quite useful to small and subsistence farmers providing them a viable option to overcome weakness of clonally propagated tuber seed. Only 100 g TPS is needed for one ha as compared to nearly 2-2.5 tones of seed tubers required to plant the same area. Keeping in view the above listed constraints faced by the growers and considering advantages of, TPS, the True Potato seeds can be used as a suitable alternative technology of potato cultivation in the state to improve the productivity and reduce the cost of production. Such seeds have the potential to fit into varied agro climatic situations. Potato production from TPS is emerging as promising and better alternative method of potato production in the state. At the same time production may be obtained up to the level of 35 tons per ha. Thus, TPS can serve as a great alternative to the seed tubers in the hilly state of Tripura. TPS technology therefore, could be used successfully in the potato cultivation.

The intervention

Since time immemorial potato cultivation is common in North Pulinpur ADC village of Khowai district of Tripura. *Kufri Jyoti* is the only variety largely accepted by the potato growers. *Kufri Chandramukhi* is also popular as a short duration variety and for its good taste. The potato production technology was standardized by KVK Divyodaya, West Tripura by introducing TPS. Gradually the TPS technology started getting popular response in the village. A tiny botanical seed of potato substitutes a bulky quantity of potato see tuber. Only 100 gm of TPS is sufficient to cover one ha area instead of planting 2-2.5 tones of potato seed tubers. Practically no cost is involved for transporting TPS unlike seed tubers. TPS gives more resistance to pests and diseases. Seeds are sown at 0.5 cm depth in raised nursery beds of 15 cm. prepared to good tilth with finely powdered dry cow dung in rows 10 cm apart and provided shade. Watering is done with fine rose cane and foliar spray with urea solution @ 0.1% is done from 15^{th} day after sowing on alternate days till the seedlings are ready for transplanting (5 to 28 days) with 3-4 leaves. FYM @ 20-25MT/ha and N: P: K @ 75:100:150 kg per ha is applied.

Extent of adoption

TPS technology an area of 10 ha at North Pulinpur village under NICRA (National Innovations in Climate Resilient Agriculture) project with the technological support of KVK, West Tripura were covered where large numbers of farmers adopted the technology.

Impact of the intervention

Raising potato crops through TPS has been found to be highly remunerative to the potato growers. The economics of TPS cultivation in comparison to the local practice i.e. producing potato (var. *Kufri Chandramukhi, Kufri Jyoti* etc.) through cut tubers has been worked out and presented in Table 1.

The urgent need

Nath and Patel (2014) conducted a study on Training need of TPS growers of Tripura. The study was conducted in Khowai district to find out the training need of TPS growers of Tripura. They reported that the TPS growers in the main areas of training need

perceived that plant protection measures as their first and top most required training need indicating its percentage, i.e., 85.00 % followed by manures and fertilizer management (72.50 %,) and seed treatment

Table 1. Economics of TPS cultivation

Sl. No.	Technology	Avg. yield (MT/ha)	Avg. cost of cultivation (Rs in lakh/ha)	Avg. price of the produce at which sold (Rs/kg)	Avg. gross return (Rs in lakh/ha)	Avg. net return (Rs in lakh/ha)	B:C
1.	Tuberlet (from TPS)	18.00	0.87	25.00	3.38	2.80	3.89
2.	Table potato (from TPS tuberlet)	26.13	0.78	11.25	2.92	2.14	3.76
3.	Farmers' practice	15.88	0.70	12.00	1.80	1.10	2.57

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 1.,2.,3.,4. Demonstration plots on TPS under National Innovations in Climate Resilient Agriculture (NICRA)

(67.50%) which received 1st, 2nd and 3rd rank respectively. It was also found that the perceived sub areas by respondents were awareness about use of various insecticide and pesticide as the top most relative need indicating 93.33% with 1st rank followed by the identification of major insect pest and disease (91.67%) and cause of spread (85.83%) which received the 2nd and 3rd rank respectively.

Conclusion

It may be concluded that the knowledge gain of TPS growers need to be enhanced through focused training priority on plant protection measures of their crops. These includes primarily on the use of time specific fungicides and insecticides, proper identification of particular pests and diseases and their nature of spread etc. Farmers are not getting optimum assured profit due to lack of sufficient knowledge with respect to above mentioned identified top reasons as well as its application in their field. So, it is utmost necessary that the agricultural extension workers, through regular trainings on plant protection measures with the TPS growers should guide the farmers to get optimum yield per unit area by effective management against pests and diseases.

References

Anonymous. 2005. True potato seed for potato production in NE states of India. Extension folder published by CPRI, Shimla.

FIB. 2008. *Farm Guide 2008*. Farm Information Bureau, by Directorate of Horti and Soil Conservation, Dept. of Agriculture, Government of Tripura.

Nath, D. and L.C Patel. 2014. Training need of True Potato Seed (TPS) growers of Tripura. *Agriculture Update*, **9**(2): 259-261.

Paul, S., A.K. Tripathi, A. Debnath, S. Shil, D. Barman and M. Chakraborty. 2015. Bringing prosperity to potato growers through True Potato Seed (TPS) cultivation- Exhilarating Success of KVK Intervention in Tripura State. Extension bulletin published by ICAR- ATARI, Zone- III, Meghalaya.

Singh, P.H., V.K. Chandla, S.M. Paulkhurana, I.D. Garg, K.C. Thakur, S. Singh and S.S. Lal. 2003. Potato cultivation in NE India. Extension bulletin published by CPRI, Shimla.

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