

Adoption constraints in use of true potato seeds (TPS) as planting materials in Tripura

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Received : 08-05-2017 ; Revised : 15-09-2017 ; Accepted : 20-09-2017

ABSTRACT

The study was aimed to find out the constraints in adoption of True Potato Seeds as planting material in production of potato in Tripura. A random sample of 140 respondents were interviewed with the help of structured interview schedule. It was found that the category of institutional constraints (54.28 %) was the top ranked in adoption of True Potato Seeds followed by economic constraints (50%), extension communication constraints (42.85 %), technological constraints (35.42 %) and personal constraints (35.35 %) as perceived by the farmers of Tripura.

Keywords : Adoption, constraints, potato production technology, true potato seed

Potato is an important food crop ranking fourth after rice, wheat and maize in the world. India is the second largest annual producer of potato after China in the world. Potato is a very popular and important cash crop in India and it produced 455.69 lakh tonnes from 20.63 lakh hectares with average productivity of 22.09 t ha⁻¹ during 2015-16 (NHB, 2015). Compared to national average of 18.2 t ha⁻¹, potato yield in the NE states except Tripura (19.7 t ha⁻¹) has been all time low (4.2- 8.3 t ha⁻¹) (FIB, 2008). Despite the significant progress in potato research and developments, the national average yield (presently 18.2 t ha⁻¹) still continues to be low as compared to the developed countries. An important reason for this yield gap is the dearth of quality planting material. There are many states/potato growing areas in the country, where quality tuber seed cannot be produced under the prevailing agro-climate condition. True Potato Seed (TPS) technology is one of them. Compared to other techniques, TPS is a cost-effective propagating material and could be used by the farmers for generating healthy planting material in desired quantities. Tripura due to its geographical isolation was suffering from availability of potato seed tuber at reasonable price during the late eighties. No state in Eastern India was producing certified seed tuber because of un-favourable agro-climatic condition. As a result the state had to remain dependent on North Indian seed tuber producing states by spending a huge amount in transportation, thus making the quality seed tuber available at higher price to a limited number of farmers making the production a costly venture. The main reasons for the low potato yield 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. The low potato yield in the

North Eastern Hill (NEH) region could be attributed to many factors. However, per capita availability of potato in the region is higher than the national level (Singh *et al.*, 2003). In Tripura, TPS could be an alternative technology to increase productivity and reduce the cost of potato production. This has not only saved huge amount of public money but also helped the marginal farmers of the state to realise a significant increase in production, thus making the state as possessing the highest yield (t ha⁻¹) in the whole NE India, which is nearer to the national average. In Tripura, True Potato Seed (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 3 tonnes of seed tubers required to plant the same area. TPS is convenient and inexpensive to store from one planting season to another and can be stored even for several years under ambient conditions by maintaining seed moisture content between 3-5 per cent during storage. Easy transportation, as only 100g TPS is needed for planting one ha area instead of nearly 3 tones seed tubers. TPS provides an opportunity to fit potato into different cropping systems as tuber seed of correct physiologically age cannot be available to the farmers as and when required. Multiplication of healthy/ quality material through TPS is much faster than the traditional process of certified seed production. Utilization of TPS can eliminate the production of foundation and basic seed required in the formal tuber seed production system. Despite having the potential to provide good alternate to the traditional sources, there could be several hindrances being faced by the farmers during adoption of TPS as planting material which were explored during the present study in Tripura.

MATERIALS AND METHODS

The present study was carried out in Tripura during 2015-16. Ex-post facto research design was employed. Out of total eight districts in the state, Dhalai district was selected keeping in view of highest population, population density and highest numbers of potato growers. A total five number of villages were covered. The data were collected by personal interview method with the help a survey schedule developed for the study. A total of 140 famers were interviewed to mention his/her constraints in adoption of recommended true potato seeds for potato production. Frequency, percentage and rank were used as statistical measures to analyze the data. Mean percent score (MPS) was calculated for each of the constraint on the basis of their degree of magnitude and ranked in order of their importance as suggested by Tanwar (2011).

RESULTS AND DISCUSSION

The adoption constraints in use of True Potato Seeds (TPS) as planting materials by farmers are presented under five types of constraints such as economic constraints, technological constraints, extension communication constraints, institutional constraints and personal constraints and the results are presented in the tables 1 to 6.

Table 1: Economic constraints faced by the potato growing farmers in adoption of TPS as planting material

Constraint	Frequency	Percentage	Rank
Non-availability of True potato seeds	82	58.57	I
Low profit from sale of potato	78	55.71	II
Lack of proper marketing facilities.	74	52.85	III
High cost of inputs	70	50	IV
Lack of adequate remunerative price for output	68	48.57	V
Lack of timely availability of fund for arranging inputs	52	37.14	VI
Overall		50	

Economic constraints

Study reveals number of economic constraints as give in table 1. Maximum number of respondents (58.57%) reported non-availability of True Potato Seeds and it was ranked first by them. Low profit from sale of potato was the second major financial constraint as perceived by the respondents (55.71 %). Lack of proper marketing facilities was the third constraint faced by respondents (52.85 %) followed by high cost of input, lack of adequate remunerative price for output and lack of timely

availability of fund for arranging inputs. Biswas and Nath (2013). mentioned few socio-economic constraints, such as lack of adoption of technology in large scale followed by lack of agricultural labour, lack of sufficient loan and low yield.

Table 2: Technological constraints faced by the potato growing farmers in adoption of TPS as planting material

Constraint	Frequency	Percentage	Rank
Lack of Knowledge of IPM/INM	56	40	I
Lack of accountancy management.	52	37.14	II
Lack of improved potato practices	50	35.71	III
Lack of technical help	48	34.28	IV
Overall		35.42	

Technological constraints

In case of technological constraints, lack of knowledge of integrated pest management /integrated nutrients management was ranked first by the respondents (40%) followed by lack of accountancy management (37.14%) (Table 2). It was found that farmers have any little knowledge of integrated pest management/integrated nutrients management. Lack of improved potato practices (35.71%) was third ranked followed by lack of technical help (34.28%). Biswas and Nath (2013) found that main technical constraints were non availability of agricultural inputs.

Table 3: Extension and communication constraints faced by the potato growing farmers in adoption of TPS as planting material

Constraint	Frequency	Percentage	Rank
Lack of knowledge about recent technologies.	68	48.57	I
Inadequate demonstration of new technologies	62	44.28	II
Irregular visit of extension worker/ scientist and VLWs	58	41.42	III
Lack of mass-media contact	52	37.14	IV
Overall		42.85	

Extension and communication constraints

Communication plays a vital role in spreading of any new technology into a community. As evident from the table 3, lack of knowledge about recent technologies (48.57%) was ranked first followed by inadequate demonstration of new technologies, irregular visit of

extension worker/scientist and village level workers (37.14 %) and lack of mass-media contact (41.42 %).

Institutional constraints

No timely service and supply of TPS (60.71 %) was ranked first. Lack of intensive training with respect to use true potato seeds (58.57 %) was ranked second followed by lack of trained personnel (53.57 %) and lack of advance information (44.28 %). Kumar and Sinha (2009) revealed that inadequate availability and high cost of quality tuber seed have been reckoned as the major constraints to potato cultivation.

Table 4: Institutional constraints faced by the potato growing farmers in adoption of TPS as planting material

Constraint	Frequency	Percentage	Rank
No timely service and supply of TPS	85	60.71	I
Lack in an intensive training in the use TPS	82	58.57	II
Lack of trained personnel	75	53.57	III
Lack of advance Information	62	44.28	IV
Overall		54.28	

Personal constraints

Scattered land (40 %) was ranked first in case of personal constraints. The second most important constraints was family size (37.14 %) followed by size of cultivated land (34.28 %) and educational level (30 %). Biswas and Nath (2013) found that personal constraints were small cultivable land followed by scattered land, low level of education and large family size.

Table 5: Personal constraints faced by the potato growing farmers in adoption of TPS as planting material

Constraint	Frequency	Percentage	Rank
Scattered land	56	40	I
Family size	52	37.14	II
Size of cultivated land	48	34.28	III
Educational level	42	30	IV
Overall		35.35	

In order to find out the relationship between the ranks accorded by the respondents to different category of constraints, rank order correlation was calculated (Table 6). It is clear that the category of institutional constraints (54.28 %) was the top ranked as perceived by the respondents in adoption of true potato seeds. it was followed by economic constraints (50%), extension communication constraints (42.85 %), technological

constraints (35.42 %) and personal constraints (35.35 %) which were ranked 2nd, 3rd, 4th and 5th by the respondents, respectively.

Table 6: Category-wise ranking of constraints faced by the potato growing farmers in adoption of TPS as planting material

Category	M.S	M.P.S	Rank
Institutional	0.54	54.28	I
Economic	0.50	50	II
Extension communication	0.42	42.85	III
Technological	0.35	35.42	IV
Personal	0.35	35.35	V

MS= Mean Score, MPS= Mean Percentage Score

The respondents suggested that inputs like seed, fertilizer, pesticides, fungicides etc should be made available at subsidies rate on proper time at village level. Extension agent should convey right information at right time. Proper marketing channel should be made available and training should be provided. Multiple responses were taken to ascertain the constraints faced by the TPS growers in adoption of recommended True Potato Seeds (TPS) as Planting Materials. The present study reported that there are several hindrances which farmers were facing in adoption of TPS for potato productions. On comparison of all these five types of constraints faced by the respondents, it can be inferred that institutional constraints were the most serious constraints faced the respondents followed by economic, extensions and communication, technological and lastly personal constraints.

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