



True Potato Seed (TPS): An Alternative Technology for Commercial Cultivation of Potato in Bihar

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ABSTRACT: *For standardization of TPS (True Potato Seed) transplanting time, seedling tuber size and fertilizer application the experiments were conducted on experimental research plot of TCA, Dholi along with farmer's field with selected True Potato Seed populations. Total tuber yield (q/ha) varied from 90.50 to 128.00 q/ha. Early transplanting by second week of November was found most suitable for superior TPS transplanting. Application of N-100kg, K₂O-100kg and Mustard Cake 10 q per ha in seedling transplanted crop was found most profitable. The seedling survival at harvest in farmer's field varied from 50.00 per cent to 63.00 per cent. The seedling tuber size of 10-20 gram gave equal tuber yield as compared to normal seed potato size (30-40 g). As the tuber yield from TPS seedling transplanted crop is poor in alkaline-saline soils of North Bihar, farmers are very much interested to transplant TPS seedling in small area to get good quality seedling tubers potato for large scale commercial production in future.*

KEYWORDS: TRUE POTATO SEED, SEEDLING TUBER SUITABLE – TECHNOLOGY, TUBER LETS, STANDARDIZATION

INTRODUCTION

Bihar is the major potato growing state after Uttar Pradesh and West Bengal. Though the conditions of state are suitable for potato cultivation, the productivity of potato in Bihar is low as compared to other state like UP and West Bengal, because of non-availability of good quality seeds at affordable price (Gopal et al 2001) and cultivation with low input under alkaline saline soils. Potato is traditionally grown vegetative through tuber, generally through farmer's saved potato seed. This resulted in accumulation of various tuber born diseases in seed tubers and consequents reduction in tuber yields (Khurana, 1999). Alternate technology of potato production through TPS has been found suitable for adoption in most potato growing areas of the country including Bihar (Gupta et.al. 2004 and Kumar S.



and Eradasappa E.2010). Keeping in view the advantage of TPS (True Potato Seed Technology) technology the experiments were conducted on research farm along with farmers' fields to test its suitability and its standardization for more profitability.

MATERIALS AND METHODS

Four experiments were conducted with the use of selected TPS varieties at Tirhut College of Agriculture, Dholi (RAU Pusa, Bihar), Research farm and farmers' fields. The main objective of first experiment was to find out suitable date of transplanting with varieties TPS C – 3 and HPS 1/13, second to find out requirement of nutrients for TPS transplanted crops with variety 92-PT-27, third experiments was conducted with the different TPS seedling tubers of the above three varieties to find out the suitable seedling tuber size and the fourth experiment was conducted in farmers field. The TPS seed of 92-PT– 27 was given to farmers of different villages of Bihar for conducting the demonstration to standardize and popularized the cultivations through TPS varieties. All experiments were conducted in RBD.

TABLE:- SEEDLING SURVIVAL AND TUBER YIELD IN FARMERS FIELD

Farmers No.	First Year		Second Year	
	Per cent Seedling Survival	Total tuber yield(q/ha)	Per cent Seedling Survival	Total tuber yield(q/ha)
1.	53.00	92.00	65.00	125.00
2.	63.00	127.5	71.5	131.5
3.	50.00	90.50	60.00	93.50
4.	54.00	94.60	68.00	128.5
5.	60.00	100.00	61.00	105.0
6.	61.00	100.50	70.00	127.5
7.	58.00	99.50	69.00	122.00
8.	62.00	115.00	68.00	110.00
9.	63.00	127.00	71.0	126.5
10.	61.90	119.00	61.00	100.5
11.	58.00	105.50	66.00	93.50
12.	60.00	117.50	64.00	101.5
13.	56.00	100.50	69.00	104.00
14.	61.00	110.5	70.00	115.00
15.	63.00	128.50	71.00	125.5



RESULTS AND DISCUSSION

The result of first experiment on date of transplanting TPS conducted with variety TPS C-3 and HPS 1/13 indicated that early transplanting (up to second week of November) gave significantly higher total and marketable tuber yield for both the varieties during both year. The seedling survival was also better in early transplanting. Late transplanting adversely affected both the seedling survival and tuber yield to both the varieties (Varshney *et al* 2007).

In nutrients management in seedling transplanted crops during Rabi 2000-01 the effect of treatment was non-significant. However, it was observed that highest dose of N @ 200 kg/ha gave highest total tuber yield which was at par with 100kg/ha application. There was no effect of increasing dose of K₂O on tuber yield. The application of 10q/ha mustard cake increase 9q/ha tuber yield but at par with no application of mustard cake. During Rabi, 2001-02, N x K and K x C as well as N x KxC interaction were significant for total tuber yield and K as well as K x C for marketable tuber yield. The highest total tuber yield was recorded in treatment N2K1M1 and marketable tuber yield the highest total tuber yield was recorded in treatment N2K1M1 and marketable tuber yield in treatment N3 K2 M1. The application of 10 q/ha mustard cake increase 7 q/ha tuber yield over control. Overall it is concluded that application of 100 kg N and 100 kg K₂ O gave equally superior tuber yield as compared to higher dose. Overall in both the experiment the total as well marketable tuber yield obtained is very poor. This may be due to the fact the seedling survival as well as crop growth is very poor in alkaline saline soils of North Bihar, further the yields were recorded at 90 days harvest, however all the three recommended TPS varieties are late in maturity. When the harvest of these varieties was delayed the tuber yield obtained to the line of 175 to 184 q/ha. (Varshney *et al* 2007).

The study of the effect of seedling tuber size of these three TPS varieties indicated that tuber size of 30-40g though gave highest total tuber yield (38.70 t/ha) which was statistically at par with the tuber yield (36.52 t/ha) obtained from tuber size of 10-20g and from >40g seedling tuber (34.17 t/ha) (Behacovsi 1975). The seedling tuber size of <10g gave 28.73 t/ha tuber yield. Out of three TPS varieties tested, 92-PT-27 and TPS C-3 gave significantly superior total tuber yield (35.45 and 36.55 t/ha, respectively) over HPS 1/13



(31.06 t/ha) (Verma et al 2007). Thus, the non-marketable tuber produced from TPS transplanted crop can profitably utilized to grow ware potato production by the farmers. Though the tuber yield obtained from TPS transplant crop is very poor in alkaline-saline of North Bihar but the production potential of seedling tuber is Tremendous and the crop is also free from prevalent diseases of the potato crop. The seedling survival at harvest in farmer's field was varied from 50.00 to 63.00 per cent in 1st year and 60.00, 71.00 per cent in 2nd year, respectively. Tuber yield (q/ha) varies from 90.50 to 128.50 1st year and 93.50 to 131.50 in 2nd year. As the tuber yield from TPS seedling transplant crop is poor in alkaline-calcareous soil of North Bihar. Farmers are interested to transplant TPS seedling in small area to get good quality seedling tubers to be used as seed in next year.

The studies conducted on TPS crop at this centre the following conclusion about present status and its scope may be drawn:

PRESENT STATUS OF TPS

1. There is need to develop early maturing genotype of TPS.
2. The presently recommended varieties of TPS are late in maturity.
3. The tuber yield from TPS transplant crop are very low in alkaline saline soil of North Bihar
4. Early transplanting (by 2nd week of November) gave superior tuber yield.
5. Application of 100kg N., 100kg K₂O and 10 q/ha mustard cake was found appropriate in place of present recommended dose of fertilizer.
6. TPS varieties 92-PT-27 and TPS C-23 gave better tuber yield in the region and may be harvested after 120 days to realize their production potential.

ITS SCOPE: -

1. TPS transplant crop may be taken by the farmers in small area to produce seedling tubers.
2. Non-marketable seedling tubers have high production potential and can be profitably utilized for ware potato production.



3. The farmers are very much interested to transplant TPS seedling in small area to get good quality seedling tubers to be used as seed in next year.
4. Thus, production of seedling tubers of different TPS varieties may bridge the gap of availability of quality seed tubers in the Bihar.

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