New Delhi Publishers

Economic Affairs

DOI: 10.5958/0976-4666.2014.00042.4

Constraints for adoption of recommended crop production technologies faced by the potato growers in the sub-tropical zone of Jammu division

Quadri Javeed Ahmad Peer[1]✉, Sheikh Muzaffar Ahmad[2], M H Chesti[3], Jasvinder Kaur[4] and Anil Bhat[5]

[1,2]Div.of Agriculture Statistics, Economics and Extension , Faculty of Agriculture, Wadura, SKUAST-Kashmir, India.
[3]Directorate of Extension Education. SKUAST-Kashmir, India.
[4]Div. of Agri Ext. Edu, H.A.U. Haryana, India.
[5]Div. of Agri Economics, SKUAST-Jammu, Main Campus Chatha, India.

✉Corresponding author: qadrijavid2008@gmail.com

Paper No. 181 Received: 17 October, 2014 Accepted: 18 December, 2014

Abstract

The present study was conducted during 2011-2012 in purposively selected sub-divisions of Jammu province, Jammu and Kashmir covering 15 villages and a sample of 225 potato growers was selected through proportionate random sampling method. The study revealed that the major constraints for the adoption of crop production technologies faced by the potato growers were complicated seed treatment technique (100.00%), non-availability of fertilizers at proper time (76%), financial problem (72.89%), non-availability of insecticides/ pesticides at proper time (64.64%), high cost of fertilizers (61.77%), high cost of seed (60.04%), high cost of fungicides (57.78%) and labour problem (54.66%).

Keywords: Constraints, Potato, Adoption and Production technologies

Potato (Solanum tuberosum Linn.) ranks fourth among the staple food crops of the world. It is the stable food of almost half of the world's population. The global area under potato during 2009 was about 18.28 million ha, with a total production of 343.91 million MT (Saxena and Mathur, 2013). It is a short duration (110-120 days); and a fertilizer responsive crop and is successfully grown on a wide variety of agro climatic conditions. Potato is an economical food and provides a source of low cost energy to human diet. It is as balanced vegetable food crop as any other cereal like wheat, rice and maize. It also contains important minerals like calcium, phosphorus, potassium, iron and magnesium. In world scenario, India is the second largest producer of potato (Scott and Suarez, 2011, 2012). Producing 42.34 million MT covering 1.86 million ha with an average yield of 22.72 t/ ha (Agricultural statistics at a glance, 2012). Potato is highly remunerative crop of Jammu and Kashmir and is a leading cash crop in Jammu province. Knowledge of these constraints is essential to undertake appropriate measures which need to enhance the potato production in the state. (Mishra *et al.,* 1987 pointed out that not more than 15-20% of available technology has reached to the Indian farmers as against 80-85% in some of the developed countries. (Lal, 2011) reported that high cost of production and lack of credit facilities for poor farmers were the most serious constraints perceived by 84.44 and 78.51% of farmers respectively. On the other hand, low profitability was perceived as the least serious constraint by 12.96% farmers followed by 7.40% of farmers who had not considered potato cultivation as business. Nand and Kokate, 1990. reported that ignorance of scientific method of storage of potato (88%) and lack of assured source of irrigation (68%) as major technological constraints, whereas costly cold storage (95%) costly improved

seeds (94%), costly fertilizer (94%), lack of fund to buy chemicals and the sprayers (93%) were the major economic and physical constraints. Lal, 2011 further revealed that middle man, cheating by the traders, low sale price of potato, shortage of electricity, gluts, poor quality and adulterated fungicides, lack of cold storage facilities, low risk bearing ability of the potato farmers, lack of motivation from State Department of Agriculture and State Department of Horticulture and unavailability of good quality potato seed to the farmers were also most serious constraints perceived by the farmers in adoption of potato technology. Treatment of seed is a complicated technique faced by farmers and non-availability of cold storage in the village and in close vicinity was perceived as crucial infrastructural constraints inhibiting the farmers in adoption of scientific cultivation of potato. Looking to the present increasing production scenario of the country, it can be foretold that potato will be the important vegetable crop to satisfy the vegetable requirement of the country in coming days. However, many of the potato growers could not adopt the recommended potato production technology in view of large number of constraints in doing so. With this background, the present study was undertaken to ascertain the present status of constraints which are being faced by the potato growers in Jammu Division

Methodology

Jammu and Kashmir State has varied diverse climatic zones of temperate, sub-tropical and cold desert. The study was conducted in Jammu province (sub-tropical). Three districts namely Jammu, Kathua and Samba were selected purposively on the basis of maximum area under potato crop. Eleven villages from Jammu district, three villages from Kathua district and one village from Samba district were selected purposively on the basis of proportionality of area under potato cultivation. Thus 15 villages with the highest area under potato crop in each of the three districts were selected for the present study. Fifteen respondents were selected randomly from each village thus making a total sample size of 225 (Table 1).

The constraints were measured on a dichotomous scale i.e. yes and no. A score of one was given to the respondents who faced constraints and zero score was given to them who had not faced any constraints. The interview schedule was pre-tested in a non-sampled area and then making necessary modifications after the data were collected through personal interview from the respondents. The findings are presented as per the expressed responses of the respondents.

Table 1. Sampling plan for Selection of the districts, Sub-divisions, Villages and Respondents

District	Sub division	Area under potato crop (ha)[1]	No.of potato growing villages[1]	No. of villages selected by proportionate sampling method (proportionate to area)	No. of potato growers were selected by randomly
Jammu	Marh	1100	16	7	105
	R S Pura	700	11	4	60
Kathua	Hira Nagar	450	7	3	45
Samba	Samba	85	8	1	15

(Source 2010)

Result and Discussion

Table 2. Economic constraints faced by the respondents in adoption of potato technology.

n = 225

Constraints	Number	Percentage
High cost of fertilizers	139	61.77
High cost of insecticide pesticide	122	54.22
Less support price	225	100.0
Price fluctuation	225	100.0
Lack of credit facility	225	100.0
High cost of seed	136	60.04
High cost of weedicides	95	42.22

It is clear from the data presented incorporated in Table 2 that all of the respondents had reported that less support price, price fluctuation and lack of credit facility were the main constraints which were faced by them in marketing of potato. The figures in Table 2 further revealed that high cost of fertilizers, high cost of seed, high cost of insecticide pesticide

and high cost of weedicides were the problems faced by 61.77, 60.04, 54.22 and 42.22% respectively by the potato growers in adoption of potato technology. These findings are in line with the findings of Patel *et. al.* (2012). Who were stated that high cost of inputs and fluctuating price behaviour were the major constraints faced by the potato growers.

Table 3. Constraints faced by the respondents in adoption of recommended improved seeds

n=225

Constraints	Number	Percentage
Difficulty in getting the seed of required variety	103	45.77
Disease free seeds not easily available	81	36.00
Lack of knowledge of variety wise seed rate	37	16.44
Non-availability of storage facilities for potato tubers in potato growing villages	189	84.00
Treatment of seed is a complicated technique	225	100.0
Lack of improved seed varieties	39	17.33

The data presented in the Table 3 revealed that 100% respondents reported treatment of seeds is a complicated technique. Other constraints as expressed by them were the non-availability of storage facilities for potato tubers in potato growing villages (84.00%), difficulty in getting the seed of required variety (45.77%), disease free seed not easily available (36.00%), lack of improved seed varieties (17.33%) and lack of knowledge on variety wise seed rate (16.44). These findings are in agreement with the findings of Kumara and Pandey (2008) who had reported that the major constraints in adoption of improved technologies have been identified as non-availability of good quality of improved seed varieties at affordable price and inadequate cold storage space for potato tubers.

Table 4. Constraints faced by the respondents in adoption of recommended fertilizer application

n = 225

Constraints	Number	Percentage
Lack of labour	80	35.55
Non-availability of fertilizers at proper time	171	76.00
Lack of knowledge about dose and time of application	84	37.33

It is clear from the data presented in Table 4 that overall, majority of the respondents 76.00% reported non-availability of fertilizers at proper time as the main reason of non-adoption of recommended fertilizer application because the farmers had adopted less than and more than recommended doses of fertilizers. The other constraints that hinder the adoption of recommended technology were lack of knowledge about dose and time of application (37.33%) and lack of labour (35.55%).

Table 5. Constraints faced by the respondents in adoption of recommended plant protection measures

n = 225

Constraints	Number	Percentage
Weed control		
Lack of technical guidance	58	25.77
Lack of time	106	47.11
Lack of skilled labour	121	53.77
Insect-pest control		
Non-availability of insecticide/ pesticide at proper time	157	64.64
Problem in identifying the insects/pests	64	28.44
Financial problem	164	72.89
Lack of appropriate spraying equipment's	60	26.67
Lack of skilled labour	100	48.44
Lack of technical know how	83	36.89
Lack of knowledge about correct dose of insecticide/ pesticide application	65	28.89
Disease control		
High cost of fungicides	130	57.78
Lack of technical knowledge in identifying disease	111	49.33
Lack of technical know-how in the application of fungicide	45	20.00
Lack of appropriate spraying equipment's	60	26.67
Non-availability of skilled labour	116	51.56

Multiple Responses

Weed control

The predominant weeds effecting the potato fields in Jammu region are Senji (*Medicago sativa*), Krishanneel (*Anagallis arvensis*), Motha (*Cyperus rotundus),* Ghau Ka Mama (*Phalaris minor*), Jangli Aizwain (*Trachyspermum sps)* and farmers are reported that they had used herbicide like Materibuzin for the control of weeds in potato crop. A perusal of data presented in the Table 5 revealed that more than half of the respondents (53.77%) faced the constraint of lack of skilled labour, whereas lack of time, high cost of weedicides and lack of technical guidance were reported by 47.11, 42.22 and 25.77% respectively. 47.11% reported lack of time. High cost of weedicides (42.22%) and lack of technical guidance (25.77%) were other constraints faced by the respondents in adoption of the recommended plant protection measures of potato crop. These findings are in consonance with the findings of Prakash (2009).

Insect-pest control

It is clear from the data depicted in Table 5 that majority (72.89%) of the respondents faced the constraint of financial problem followed by non-availability of insecticide/ pesticide at proper time (64.64%). The other constraints faced by the respondents in adoption of recommended plant protection measures are Endosulphan 35% EC and Dimethoate 30% EC are used in study region by the potato growers to control the insect-pest of potato crop reported were high cost of insecticide/ pesticide (54.22%), lack of skilled labour (48.44%) lack of technical knowhow (36.89%), lack of knowledge about the correct dose of insecticide/pesticide application (28.89%), problem in identifying the insects/pests (28.44%) and lack of appropriate spraying equipment's (26.67%). It is pertinent to mention that in the study area Endosulphen 35 EC and Dimethoate 30 EC were being used by the respondents for managing the insect pest problem. These findings are in conformity with the findings of Prakash (2009) had reported that high cost of chemicals, non availability of chemical, financial problem, lack of technical help and lack of knowledge were the main constraints faced by farmers in adoption of recommended insect-pest control practices in potato crops.

Disease control

In the study region the farmers had faced diseases (Late blight and early blight) in potato crop which hinder the crop production. The data presented in the Table 5 revealed that overall majority (57.78%) of the respondents reported high cost of fungicide as the major constraint for the non -adoption of recommended disease control measures of potato crop, followed by the non-availability of skilled labour (51.56%), lack of technical knowledge in identifying diseases (49.33%) and lack of appropriate spraying equipment's (26.67%). Only 20.00% of the respondents mentioned the reason of lack of technical knowhow in the application of fungicide for non- adoption of recommended practice. Shailbala and Pathak (2008) reported that major constrains in the adoption of improved technology for potato cultivation related to plant protection measures were incidence of disease, specific pests, indiscriminate use of pesticides for immediate control of disease and pest.

Conclusion

It could be concluded from the findings that high cost of chemicals, non-availability of disease free seeds, non-availability of plant protection measures, lack of labour, lack of time, lack of technical knowledge, financial problem, poor shelf life, lack of knowledge for identifying insect and diseases, lack of appropriate spraying equipments, inadequate supply of storage material, lack of marketing facilities, less support price and price fluctuation were the main constraints encountered by the potato growers in the adoption of recommended crop production technologies. Therefore, more emphasis should be given to some of the most serious constraints, such as lack of technical knowledge, inadequate supply of storage material, lack of marketing facilities and less support price and though the distribution of pertinent literature in simple language on potato cultivation among the potato growers

Suggestions for promoting adoption of the recommended crop production technologies by the potato growers

Based on the findings of the study and discussion with the potato growers, some of the suggestions for promoting the adoption of the recommended crop production technologies among the potato growers are given as under.

1. Potato growers need to be educated regarding the use of treated seeds. This information can be provided to the farmers through extension personnel of the State Department of Agriculture, Jammu before sowing of seeds.
2. Majority of the respondents had not used the recommended doses of fertilizers and manures. The farmers need to be educated and motivated to use the correct doses of fertilizers and manures, so that they can get the higher returns, by reducing expenditure. This can be done by laying out result demonstrations, arranging visits to the progressive farmers' fields and group discussions.
3. Provision should be made for adequate and timely supply of essential inputs, such as improved varieties, fertilizers, insecticides and fungicides along with timely finance and credit facilities for the potato growers at low rates of interest.
4. The extension functionaries working at the grass root level should take initiative in developing contacts with them and the potato growers should be encouraged to participate in various extension activities like farmers day, Kisan Mela etc.
5. Short educational visits of potato growers should be arranged to various agricultural/ horticultural universities, research stations and fields of progressive farmers.
6. There should be a provision for the team of experts for guiding and solving the problems of the potato growers on the spot in the field through observation and discussion.
7. The results of the study indicated that due to non-availability of proper spraying equipment's, the respondents were unable to adopt chemical control measures for the control of insect and diseases of potato crop. So spraying equipment's should be made available to the potato growers on rent/charge basis.
8. The findings of the study have revealed that lack of technical knowledge as main constraint in the adoption of the recommended production technologies. So awareness should be created among the potato growers for the scientific cultivation of potato crop through the use of mass media like radio. T.V., newspaper, video films, pertinent literature and by organizing short term training programmes for them.
9. Government should come up with programmes which will help the farmers in selling the potato crop in distant markets to get higher returns and should check the exploitation by commission agents.

References

Anonymous 2012. Agricultural statistics at a glance. Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

Anonymous. 2010. A note on command area development Department of Agriculture, Jammu.

Kumara, N.R. and Pandey, N.K. 2008. Constraints in adoption of improved potato production technologies in Bihar. *Agricultural Economics Research Review* In: *Proceedings of 4th world congress on conservation agriculture.* New Delhi, **21**(437) (Absract).

Lal, B., Sinha1, T.K., Kumar, Anil., Pandit, A and Pandey, N.K. 2011. Constraints perceived by the farmers In adoption of potato technology. *Potato J*. **38**(1): 73-77.

Mishra, A.A., Awasthi, P.K. and Jaiswal, D.K. 1987. Constraints in utilization of farm technology in Madhya Pradesh. In: *Seminar on Constrains in TOT*, KVK, Dapoli, Oct., 20-30.

Nand, H. and K.D. Kokate, 1990. Current status and future thrust in transfer of technology. In: *Current facets in potato research,* (Proceedings of National Seminar held at CPRIC, Modipuram, Meerut, U.P.13-15 December, 1989), pp. 146-156.

Patel, B.M., Patel, J.K. and Badhe, D.K. (2012). Constraints faced by potato growers in adoption of recommended potato production technology. *Internat. J. agric. Sci.* **8**(2): 502-504.

Prakash, V. 2009. Constraints and suggestions regarding the technological gap in potato production technology in Uttar Pradesh. *Journal of Community Mobilization and Sustainable Development* **4**(11): 16-19.

Saxena, R. and Mathur. P. 2013. Analysis of potato production performance and yield variability in India. *Potato J* **40**(1):34-38.

Scott G.J. and Suarez U, 2011. Growth rates for potato in India and their implications for Industry Potato J **38**(2): 100-112.

Scott G.J. and Suarez V. 2012. The rise of Asia as the Centre at Global Potato Production and Some Implications for Industry. *Potato J.* **39**(1): 1-22

Shailbala, and Pathak, C. 2008. Harnessing the potential of Potato to meet increasing food demand, *Kurukshetra* **56:** 45-48