

Awareness and adoption level of improved practices by pear growers of Tarn Taran district

S. Khehra* and P. Kaur

Punjab Agricultural University, Farm Advisory Service Centre, Tarn Taran-143401, India. *E-mail: savreetkhehra@pau.edu

Abstract

Pear is one of the most important fruit crops of the temperate region. However, in Punjab, a low chill variety Patharnakh, has been widely cultivated and become the commercial fruit crop. The present investigation was conducted to assess the awareness and adoption of recommended pear production practices to narrow the adoption gaps so as to achieve sustainable production of quality fruits in Tarn Taran district to evaluate the effect of different technology variables on the awareness score and adoption level of recommended package of practices for pear. The study showed that the respondents along with awareness adopted some of the recommended practices for pear cultivation on priority such as timely irrigation to the plants [Awareness score (As) = 1.0; adoption level score (Al) = 2.6], use of FYM along with chemical fertilizers and timely pruning and training of the fruit plants having good awareness and adoption values. However, they were moderate in terms of weed management (As = 0.58; Al = 1.26) and practice of proper packaging and marketing of fruits (As = 0.56; Al = 1.20). On the other side, management of mite (As = 0.06; Al = 0.10) followed by use of micronutrients as balanced nutrition (As = 0.10; Al = 0.22), use of Bordeaux mixture for sap wood and root rot and use of potassium nitrate (KNO₃) for better yield were practices with least awareness and adoption values. The results indicated that, a mere awareness of technology does not lead to adoption. This gap can be bridged by imparting practical know-how with hands-on training to pear growers in the niche area.

Key words: Pear, adoption level, improved practices, practical know-how

Introduction

Pear (*Pyrus pyrifolia*), a member of Rosaceae family is next to apple in terms of acreage and production. In India, pear is mainly grown in the hills of Jammu and Kashmir, Punjab, Himachal Pradesh, Uttarakhand and Haryana. Even being a temperate fruit crop, its cultivation is expanded to the sub-tropical regions because of its highly adaptability and availability of low chill cultivars. The optimum temperature needed for growth and development of pear is 25 to 30 °C. In Punjab, it can be grown on an area of 3440 ha (Anonymous, 2020) in Amritsar, Tarn Taran, Gurdaspur, Hoshiarpur, Jalandhar and Patiala districts; however, the maximum area under cultivation is situated in Tarn Taran district and almost 40 % of the total area in the state is confined in this region (Meena *et al.*, 2017).

Farmer's awareness about the technical aspects of the recommended technology is the key component of increasing level of adoption. Adoption occurs only when there is awareness about the particular technology, whether; it is fully, partial or least adopted by the growers (Kinyangi, 2014 and Baumgart-Getz *et al.*, 2012). However, it is also very transparent *i.e.*, that mere awareness of technology does not lead to adoption. Hence, despite of being aware of utility or significance of the technology, it was not fully adopted resulting in the gap between awareness and adoption (Singh and Priyadarshi, 2010; Choudhary and Banarva, 2011) which might be due to lack of hands on training.

It has been observed that due to poor linkages between research and extension, inappropriate extension approaches results in low adoption of technology (Kumar *et al.*, 2017). Even among farmers, there is a great variation in their levels of knowledge,

as well as their readiness to accept, try new methods and adopt improved production practices. Some need more time to grasp and get convinced and; hence, need a longer sustained support from extension agencies including state Department of Horticulture, Krishi Vigyan Kendras, Farm Advisory Service Centres *etc.* Hence, dissemination of knowledge about recommended practices and demonstration of technologies for their expected gains is an important component to increase the rate of adoption level. Conventional technology transfer model is a one way (top-down) approach where growers remain simply a passive recipient of the technology. But now getting feedback from farmers have inverted this model making it two ways, also from down to top.

The pear growers in this district are more advanced in terms of technology awareness and its adoption as compared to any other pear growing areas of the state. There exists a wide productivity and adoption gap that needs to be bridged. Hence, considering the present situation, finding out the level of awareness and extent of adoption of the technology besides various factors influencing adoption formed the basis of this study. Keeping in view, the importance of pear fruit for economy of Punjab, various efforts have been done in the past from the Horticulture and Extension Departments for the dissemination of recommended practices to enhance the pear production; however the examination of the awareness and adoption of these practices needs to be evaluated. The present study was therefore planned to access the awareness and adoption level of farmers regarding recommended production practices and to suggest research and extension measures for improving the adoption rate of these practices among pear growers.

Materials and methods

Study area: Tarn Taran district is located in N-W India which further extends from 31° 05', and 31° 30' 05" N latitude and 74° 30' (India-Pakistan boundary) and 75° 15' 05" E longitudes. The district is situated in alluvial plains and covers an area of 2583 sq.km. It has boundaries with Amritsar district in the North, Kapurthala district in the East, Pakistan in the West, and Firozpur district in the South. The district is divided into 8 Blocks namely Gandiwind, Bhikiwind, Tarn Taran, Khadur Sahib, Naushera Pannuan, Chohla Sahib, Patti and Valtoha. Pear is the major fruit crop with maximum cultivation in Patti Block. Tarn Taran has tropical steppe, semi-arid and hot climate generally loaded with dryness except for a short period during southwest monsoon season. A series of western disturbances affect the climate in the cold season. The average annual rainfall of 545 mm is unevenly distributed in the district.

Methodology: The study was conducted in all the 8 Blocks of the district. A list of pear growers was prepared to analyze the adoption of technology by making the total sample size of 50 pear growers with 17 growers from Patti Block only. For the collection of data, the structured interview schedule and information on selected technology package and questionnaire was used to elicit the responses. The standard scales and procedures were followed. The responders were asked to answer about awareness of recommended pear practices as 'yes' or 'no' in the form of scale 1 and 0 and the adoption on the three point scale *viz.*, full, partial and least as 3, 2 and 1, respectively. Extent of adoption was calculated on the basis of these scores. A statistical analysis was performed by using Statistical Package for Social Science (SPSS 16). The analysis of variance (ANOVA) was used to evaluate the effect of different technology variables on the awareness score and adoption level by the pear growers. The random sampling was used along personal observations. The major thrust of study was the determination of pear growers existing level of adoption towards recommended orchard practices.

Results and discussion

The data in Table 1 revealed that the 45.24 per cent pear growers applied FYM along with inorganic fertilizers and almost same percent of respondents had the partial adoption. These findings could be attributed to farmers' lack of knowledge regarding the timing and method of application of FYM and fertilizers (Meena *et al.*, 2017). Insecticide technology was adopted by 36.36 percent of pear growers, who were also aware of the developed technology. Approximately 40% of those queried fully adopted and applied micronutrients to correct deficiencies in their orchards. Annually, approximately 47.37 percent of growers who had knowledge or awareness of the practise fully adopted canopy management practises; however, only 29.41 percent of growers fully adopted training-pruning practises to develop better tree canopy and architecture. The majority of growers (62%) used timely irrigation techniques during the critical fruit development period to improve fruit quality and yield. These results were corroborated with the findings of Yadav and Khan (2012) and Yadav *et al.* (2013). Shah *et al.* (2017) observed that the practices which were simple and were traditionally practiced were known to majority of the farmers. The practices like management of mite, fruit fly and bark eating

Table 1. Farmer's awareness and adoption level about recommended cultivation practices of pear (N=50)

Improved technology	Awareness	Adoption level	No. of growers	Percentage
Use of FYM along with chemical fertilizers	42	Full	19	45.24
		Partial	19	45.24
		Least	04	09.52
Use of insecticides for insect pest management	33	Full	12	36.36
		Partial	16	48.49
		Least	05	15.15
Use of micronutrients for balance nutrition	05	Full	02	40.00
		Partial	01	20.00
		Least	02	40.00
Pruning	38	Full	18	47.37
		Partial	12	31.58
		Least	08	21.05
Training	34	Full	10	29.41
		Partial	17	50.00
		Least	07	20.59
Weed management	29	Full	12	41.38
		Partial	13	44.83
		Least	04	13.79
Timely irrigation	50	Full	31	62.00
		Partial	15	30.00
		Least	04	08.00
Intercropping by avoiding <i>Berseem</i>	32	Full	15	46.88
		Partial	11	34.37
		Least	06	18.75
Potassium nitrate spray 1.5 % for increase in yield	07	Full	02	28.57
		Partial	02	28.57
		Least	03	42.86
Management of fruit fly with fruit fly trap	09	Full	05	55.56
		Partial	02	22.22
		Least	02	22.22
Bark eating caterpillar control by kerosene oil	08	Full	04	50.00
		Partial	03	37.50
		Least	01	12.50
Management of mite by less irrigation and removal of <i>Arind</i> and <i>Bhang</i>	03	Full	00	00.00
		Partial	01	33.34
		Least	02	66.66
Use of Bordeaux mixture for sap wood and root rot	06	Full	02	33.33
		Partial	03	50.00
		Least	01	16.67
Use of Bordeaux paint for bark canker	08	Full	03	37.50
		Partial	02	25.00
		Least	03	37.50
Soil sampling	09	Full	05	55.56
		Partial	02	22.22
		Least	02	22.22
Packing and marketing	28	Full	13	46.43
		Partial	12	42.86
		Least	03	10.71

caterpillar, application of Bordeaux mixture and paint along with potassium nitrate and micronutrient sprays were not taken on the priority. It might be due to the reason that the growers are reluctant to perform the tasks which need as described by Chavan and Katole (2013) and Meena *et al.* (2017).

The data in Table 2 shows the average awareness score (As) and average adoption level score (Al) of the pear growers on various recommended practices for pear cultivation. The findings clearly show that the respondents were not only aware but also adopted some of the recommended practices for pear cultivation on priority such as timely irrigation to the plants (As = 1.0; Al =2.6), use of FYM along with chemical fertilizers, timely pruning and training of the fruit plants. The respondents were found to be moderately aware

and adopted recommended practices for weed management and practice of proper packaging and marketing of fruits. However, there were some recommended practices to which the growers were found to be least aware and least adopted these practices for pear cultivation such as management of mite (As = 0.06; Al = 0.10) followed by use of micronutrients as balanced nutrition, use of Bordeaux mixture for sap wood and root rot, use of KNO₃ for better yield. The results of study are also supported by previous findings of Abbas *et al.* (2017) who elucidated that there might be constraints like age, literacy and reluctance to acceptance of technology. Similar findings were sustained by Kumar *et al.* (2015).

Table 2. Awareness and adoption level of different technologies

Technology	Awareness Score (AS)	Adoption Level Score (AL)
Use of FYM along with chemical fertilizers	0.84	1.98
Use of insecticides for insect pest management	0.66	1.42
Use of micronutrients for balance nutrition	0.10	0.22
Pruning	0.76	1.74
Training	0.68	1.42
Weed management	0.58	1.26
Timely irrigation	1.00	2.60
Intercropping by avoiding <i>berseem</i>	0.64	1.40
Potassium nitrate spray 1.5 % for increase in yield	0.14	0.28
Management of fruit fly with fruit fly trap	0.18	0.40
Bark eating caterpillar control by Kerosene oil	0.16	0.34
Management of mite by less irrigation and removal of arhind and bhong	0.06	0.10
Use of Bordeaux mixture for sap wood and root rot	0.12	0.24
Use of Bordeaux paint for bark canker	0.16	0.30
Soil sampling	0.18	0.32
Packing and marketing	0.56	1.20
F-Ratio	32.40	32.74
Significance	$P < 0.001$	$P < 0.001$

It is evident from Table 3 that Department of Horticulture (32 %), Punjab Agricultural University, Ludhiana and Farm Advisory Service Centre, Tarn Taran (26 %) were most preferred source of seeking information about the improved technology for the pear growers in district Tarn Taran. These results are in line with earlier finding of Anavrat (2008). The pear growers don't pay much attention towards literature regarding improved practices and don't listen to radio and TV programmes regarding pear orchard management systems. Thus, information lag and ignorance led to partial adoption.

Table 3. Source of information for pear growers about pear cultivation technologies

Source of information	Total Score	Per cent
Department of Horticulture	16	32
PAU, Ludhiana and FASC, Tarn Taran	13	26
KVK Booh	6	12
TV programme	5	10
Kisan Melas	4	8
Radio programme	3	6
Literature	3	6

It can be concluded that in district Tarn Taran, the extent of adoption of recommended practices for pear cultivation was at medium level by the pear growers. The study has clearly indicated the levels of awareness and adoption of practices in terms of fully, partially and least adopted by the growers. The examination of the awareness and adoption of recommended production practices like management of mite, fruit fly and bark eating caterpillar, application of bordeaux mixture and paint along with potassium nitrate and micronutrient sprays needs to be evaluated precisely. Therefore, participatory approach of research-extension may be beneficial to take the technology from literature to the orchards. Hands-on training on pear orchard management can have positive impact on adoption of management practices.

Acknowledgement

FASC, Tarn Taran fully acknowledges the help/support/cooperation received from the pear growers of Tarn Taran district while interacting during the time of survey.

References

- Abbas, M., I. Mahmood, A. Bashir, T. Mehmood, K. Mahmood and Z. Ikram, 2017. Factors affecting adoption of recommended citrus production practices in the Punjab. *Pakistan J. Agric. Res.*, 30(2): 202-208.
- Anavrat, V. 2008. Factors influencing adoption of improved practices by Nagpur Mandarin Growers. NRC for Citrus, Nagpur. National Symposium on Citriculture: Emerging Trends, Proc. 24-26, Jul. 2008: 162-164.
- Anonymous, 2020. *Package of Practices for Fruit Crops*. PAU, Ludhiana, India. pp: 1.
- Baumgart-Getz, A., L.S. Prokopy and K. Floress, 2012. Why farmers adopt best management practice in the United States: a meta-analysis of the adoption literature. *J. Envir. Mangt.*, 96: 17-25.
- Chavan, S. and R.T. Katole, 2013. Correlates of adoption behaviour of Kagzi lime grower in western Vidarbha of Maharashtra state. *Int. J. Sci. Res.*, 2(9): 2277-8179.
- Choudhary, H. and G.S. Banarva, 2011. Adoption of recommended Kinnow production technology. *Rajas. J. Ext. Edu.*, 19: 190-193.
- Kinyangi, A.A., 2014. Factors influencing the adoption of agricultural technology among small holder farmers in Kakamega north sub-county. Kenya: University of Nairobi.
- Kumar, P., P.S. Shehrawat and M. Khan, 2017. Adoption level of masumbi (*Citrus sinensis*) growers and its relationship with their personality traits in Haryana, India. *Asian J. Agric. Ext.*, 16(3): 1-6.
- Kumar, R., A. Ahmad and R.K. Dular, 2015. Knowledge and adoption of improved grape cultivation practices in Haryana, India. *Agric. Sci. Digest*, 35(1): 31-35.
- Meena, R.R., K.L. Geanger, B.L. Meena, P. Bhatnagar and P.L. Meena, 2017. Analysis of adoption and constraint perceived by mandarin growers in Jhalawar district of Rajasthan state, India. *Int. J. Curr. Microbiol. App. Sci.* 6(4): 1465-1470
- Shah, Z.A., R. Singh, M.A. Dar, R. Mir, J.M. Madoo and M.A. Beigh, 2017. An analysis of knowledge level of farmers of recommended apple cultivation practices in district Shopian of Jammu and Kashmir India. *J. Entomol. Zool. Stud.*, 5(6): 867-871.
- Singh, K.V. and A. Priyadarshi, 2010. Extent of adoption of improved practices of mango production by mango growers. *Indian Res. J. Ext. Edu.*, 10(3): 107-113.
- Yadav, B.S. and I.M. Khan, 2012. Adoption of improved cultivation practices of cauliflower. *Ind. J. Soc. Res.*, 53(3): 191-197.
- Yadav, B.C., R. Choudhary and P.L. Saran, 2013. Adoption of improved production technology of mandarin in Rajasthan, India: A review. *Afr. J. Agric. Res.*, 8(49): 6590-6600.

Received: December, 2020; Revised: March, 2021; Accepted: April, 2021