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A Study of Technological Gaps in Pineapple Cultivation in Darjeeling District of West Bengal

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ABSTRACT

The study on pineapple production technology adoption was conducted in Phansidewa Block of Darjeeling district of West Bengal state. The technological gap for marginal farmers' ranged from 97.11 to 32.00 per cent whereas, the marginal farmers had very little knowledge about the post-harvest technology, thus resulted poor quality. Technological gap of small farmers' ranged from 27.77 to 94.00 per cent. The technological gap for medium farmers ranged from 14.00 to 86.11 per cent. Farmers in general were not fully aware of all the recommended scientific practices. It was also evident that the farmers in general were having maximum technological gap in fertilizer application. It has been advocated that a blank recommendation for all categories of farmers will not serve the purpose hence location and farmer specific recommendations need to be devised.

Keywords: Category of farmers, Pineapple, Technology gap

INTRODUCTION

India enjoys its spatial advantage for exporting pineapple to Gulf countries as well as to European countries. India poses 1st rank in terms of harvested area (1,11,000 ha) of pineapple among the Asian and BRICS countries (FAO, (ON1407) 2017). In India, West Bengal ranked first in pineapple production (345.15, 000'MT) in 2017-18 (Ministry of Agriculture and Farmers Welfare, Govt. of India (ON1601) and (ON1955). Where, North Bengal provides the major bulks for this. Agri-Export Zone for promoting exports of pineapple has already been established in North Bengal. Despites of its huge potential the production is not to the ear mark. West Bengal is too far from true utilization of its potential. Farmers of this region have adopted different technologies of pineapple production. But most of the farmers of the area, have not adopted the total recommended package of practices regarding scientific cultivation. There is a big gap between the recommendation made by the scientists and field level adoption by the farmers. The study conducted to find out the extent of technological gaps among different categories of farmers and strategy to lessen the gap.

METHODOLOGY

Phansidewa Block of Darjeeling district, where the maximum numbers of farmers are engaged in pineapple cultivation, selected purposively for this research work. Out of 7 Gram Panchayats in this block, 3 Gram Panchayats, namely Bidhannagar–I, Bidhannagar–II and Chathat-Bansgaon were selected purposively as per the recommendations of the extension personnel working in the district and in block, where pineapple is cultivating intensively for last few years. The farmers were stratified into five categories on the basis of their size of land holdings viz. marginal (below one hectare), small (one to two hectare), semi-medium (two to four hectare), medium

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(four to ten hectare) and large (ten hectare and above). These criteria adopted from Highlights of Agriculture Census 2010-11, Ministry of Agriculture and Farmers Welfare, Government of India. As the total number of semi-medium, medium and large farmers in the study area were very few; they were grouped together and categorized as medium farmers. A total number of 200 respondents were selected randomly and were grouped into three categories i.e. marginal farmers (127), small farmers (57) and medium farmers (16). The respondents were interviewed through personal interview method with the help of structured schedule.

For quantifying the technological gap, one score was assigned to each right answer and zero score for each wrong answer or no answer in respect of each item of every questions of the technological gap. The mean score obtained and technological gaps were worked out for different categories of the farmers. Based on the gap percentage corresponding ranks were assigned.

The technological gap was calculated using the following formula:

$$\text{Technological gap} = \frac{\text{Extent of recommendation–extent of adoption}}{\text{Extent of recommendation}} \times 100$$

RESULTS AND DISCUSSION

The pineapple growers of Darjeeling district have adopted so many technologies and they are proficient enough to achieve good quality production. In spite of numerous efforts of different scientists and extension personnel, it has been observed that the production, productivity and the quality have not been reached to the expectation level of both the researcher and the growers. There is a gap between expectation and the result, and between the recommendation and practices i.e. technological gap. So it is necessary to find out the bottlenecks and extent of technological gap among different categories of farmers and strategy to lessen the gap. Here, an attempt has been made to analyse the degree of adoption of recommended package of practices for various components of pineapple cultivation practices like selection of variety, selection, preparation and treatment of planting materials, planting method, improved intercultural operations, fertilizer application, pest, disease and other physiological disorder control, irrigation, regulation of flowering and ripening, harvesting and post-harvest practices in order to work out the technological gap.

Table 1 shows that technological gap for marginal farmers' ranges from 97.11 to 32.00 per cent. It also reveals that none of the recommendations were fully adopted by the farmers. The highest technological gap was found in fertilizer application (97.11%). This gap turns into a strong need to minimize or put an end to the gaps. The gap may be due to lack of awareness of the marginal farmers about fertilizer requirements of the pineapple, balanced fertilizer dose, farmers' apathy and lack of interest regarding scientific knowledge's etc. The second major technological gap (78.50%) was found in post-

Table 1: Extent of technological gap of marginal farmers in pineapple cultivation

Practices of pineapple cultivation	Maximum attainable score	Mean score obtained	Gap in percentage	Ranks
Selection of variety	3	1.00	66.66	IV
Selection, preparation and treatment of planting materials	9	5.35	40.55	IX
Planting method	15	5.17	65.53	V
Improved intercultural operations	6	2.24	62.66	VI
Fertilizer application	9	0.26	97.11	I
Pest, disease and other physiological disorder control	11	4.46	59.45	VII
Irrigation	1	0.68	32.00	X
Regulation of flowering and ripening	4	2.36	41.00	VIII
Harvesting	5	1.65	67.00	III
Post-harvest practices	4	0.86	78.50	II

harvest practices. A large percentage of the production goes to different parts of India and to neighbouring country also. But, the marginal farmers had very little knowledge about the post-harvest technology, thus resulted poor quality.

The lowest technological gap (32.00%) was found in irrigation. They aware about the water requirement but at the same time they also mentioned that, nowadays they forced to bear extra cost due to groundwater depletion.

Table 2 reveals that technological gap of small farmers' ranges from 27.77 to 94.00 per cent. Same as the marginal farmers, small farmers also had highest technological gap in fertilizer application. They commonly believed in the more the merrier condition and thus applying the fertilizer extensively. Very few of them hardly attended any extension programmes like training, krishimela, farmers meeting, campaign, exhibition etc. They were not fully aware about the nutrient deficiency of pineapple, fertilizer requirements of their soils, methods and time of fertilizer application etc. They candidly admitted that for any fertilizer related queries they used to consult with the local fertilizer dealer. This inadequate knowledge of fertilizer management might be an important reason for low level adoption of recommended doses by the small farmers and ultimately resulted in higher technological gap. The second major technological gap (69.25%) was found in post-harvest practices. The reason behind this was same as for marginal farmers i.e. lack of knowledge. The third technological gap (66.66%) was found in selection of variety. In case of variety selection, majority of the farmers practiced only one variety i.e. Kew variety. But, they have shown their interest in other tested variety with financial support either from Government or from other organization.

The lowest technological gap (27.77%) was found in selection, preparation and treatment of planting materials. Though they know very well how to select the sucker and prepare the sucker for planting, but very few of them treat the planting materials before planting. This might be due to lack of knowledge and interests from farmers' sight and less number of extension programme attended by them in the region.

Table 3 conveys that the recommended technologies were also not fully adopted by the medium framers like marginal and small farmers. The technological gap for medium farmers ranged from 14.00 to 86.11 per cent. The highest gap (86.11%) was found in the practice of fertilizer application. The reasons behind these were found same as mentioned earlier like inadequate knowledge about fertilizer requirements of pineapple and the soil, much more dependency on local fertilizer dealers etc. They all agreed that soil testing is important before applying the fertilizer. But they were not familiar with the whole process. They have expressed their urgent need for training on soil testing by using soil testing kit. So, that they can do it by themselves. They also reported that, it will be better for them if any Government or other agency

Table 2: Extent of technological gap of small farmers in pineapple cultivation

Practices of pineapple cultivation	Maximum attainable score	Mean score obtained	Gap in percentage	Ranks
Selection of variety	3	1.00	66.66	III
Selection, preparation and treatment of planting materials	9	6.50	27.77	X
Planting method	15	6.60	56.00	VI
Improved intercultural operations	6	2.63	56.16	V
Fertilizer application	9	0.54	94.00	I
Pest, disease and other physiological disorder control	11	6.12	44.36	VII
Irrigation	1	0.65	35.00	VIII
Regulation of flowering and ripening	4	2.88	28.00	IX
Harvesting	5	1.68	66.40	IV
Post-harvest practices	4	1.23	69.25	II

Table 3: Extent of technological gap of medium farmers in pineapple cultivation

Practices of pineapple cultivation	Maximum attainable score	Mean score obtained	Gap in percentage	Ranks
Selection of variety	3	1.38	54.00	IV
Selection, preparation and treatment of planting materials	9	5.81	35.44	VI
Planting method	15	11.19	25.40	IX
Improved intercultural operations	6	3.69	38.50	V
Fertilizer application	9	1.25	86.11	I
Pest, disease and other physiological disorder control	11	7.63	30.63	VIII
Irrigation	1	0.69	31.00	VII
Regulation of flowering and ripening	4	3.44	14.00	X
Harvesting	5	2.06	58.80	III
Post-harvest practices	4	1.25	68.75	II

support them financially by providing soil testing kits individually or in group. The second highest technological gap (68.75%) was found in post-harvest technology of pineapple cultivation.

Few medium farmers did experiments on other varieties like Queen, Mauritius, MD-2, MTS, T3, Amrutha and Nanas on a limited scale. Unfortunately they faced a huge loss in their experiment (Mandal, 2015). But their attitude towards innovative practices resulted with a new history in the region. Now, they are looking for financial support from Government sector to continuing their practices.

The lowest technological gap (14.00%) was found in regulation of flowering and early ripening of the fruit. They do it by using growth regulators. They applied it to schedule the flowering of the plant and harvest to synchronise with the season of highest demand and price.

Table 4 shows the technological gap for pooled farmers. It clearly indicates that farmers in general in that region were not fully aware of all the recommended scientific practices. It also reveals that the farmers in general were having maximum technological gap in fertilizer application. The result supports the findings of Roy *et al.* (2013); Nain and Chandel (2013); Sharma *et al.* (2018) and Singh *et al.* (2018). Whereas, Basanayak *et al*. (2014), in his study observed highest mean technological gap was in disease management followed by fertilizer application, pest- management, pit size, spacing, FYM, irrigation method and plating season. Here, second highest technological gap was found in post-harvest practices. The reasons behind these two were

Table 4: Extent of technological gap of pooled farmers in pineapple cultivation

Practices of pineapple cultivation	Maximum attainable score	Mean score obtained	Gap in percentage	Ranks
Selection of variety	3	1.03	65.66	III
Selection, preparation and treatment of planting materials	9	5.82	35.33	IX
Planting method	15	6.06	59.60	V
Improved intercultural operations	6	2.47	58.83	VI
Fertilizer application	9	0.42	95.33	I
Pest, disease and other physiological disorder control	11	5.19	52.82	VII
Irrigation	1	0.67	33.00	X
Regulation of flowering and ripening	4	2.60	35.00	VIII
Harvesting	5	1.70	66.00	IV
Post-harvest practices	4	1.00	75.00	II

farmers' inadequate knowledge regarding scientific practices, lack of knowledge about nutrient management, right dose of fertilizer and time of fertilizer application. It was also noticed that some farmers used to apply comparatively cheap and easily available nitrogenous fertilizer in huge amount than other fertilizers and nutrient. That hampers the quality.

The technological gap in post-harvest practices reveals similar trend in marginal, small and medium farmers with 2nd rank. They also mentioned that one cold storage for pineapple is already built up in that region but till date it is not functioning. They believed it will help them in future to get maximum profit from their production.

CONCLUSION

Hence, to reduce the gap, improved and low cost technologies must be introduced through intensive extension system with proper training programmes for all categories of farmers from time to time. The problem faced by the majority of farmers is lack of up-to-date knowledge about pineapple cultivation technologies. New extension strategy should be used to develop favourable attitude of the farmers towards scientific practices so that, they can understand the importance of scientific recommendations and get benefitted from their harvests. For effective transfer of technology in agriculture now a day, it is essential to know which components of the technology the farmers are able to retain and to what extent. So, it is need of the hour to reduce the gap through appropriate training in new innovation. Thus, a blank recommendation for all categories of farmers will not serve the purpose. Category specific need and interests should be taken into consideration while planning any training programme for the pineapple growers of this region. Information about the gap between technology advocated and technology adopted by the farmers shall help the extension personnel in designing appropriate extension strategy.

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