

FARMER'S KNOWLEDGE, ATTITUDE AND PRACTICES ON SAFETY, QUALITY AND POST HARVEST MANAGEMENT OF BRINJAL AND TOMATO IN SOME SELECTED AREAS OF BANGLADESHM. KHATUN¹ AND M. S. RAHMAN²

Post harvest management is very important for horticultural crops. The safety and quality of horticultural crops specially vegetables largely depends on its post harvest management. Due to improper management farmers have to bear significant post harvest losses. Post harvest losses of fruits and vegetables are estimated at 5-20% in developed countries and 20-50% in developing countries (Mashav, 2010). In Bangladesh, post-harvest losses of fruits and vegetables amount to 16.73-43.5% which accounts for an annual loss of Tk. 34420 million (Hasan *et al.*, 2010; Kaysar *et al.*, 2016). The country like Bangladesh suffer much of the postharvest losses due to a number of factors such as lack of adequate knowledge and information, the unavailability of appropriate practices under funded research and development (Hasan *et al.* 2010 and Azad *et al.*, 2014). The quality and nutritional value of fresh vegetables are also affected by postharvest handling and storage condition (Sablani *et al.*, 2006). In order to reduce post harvest losses and to arrest higher profit vegetable producers in the tropics and subtropics relies heavily on chemicals such as fertilizers, pesticides and crop preservatives. Pesticide comes with a specific environmental concern due to their toxicity and persistence in the environment (Lamberth *et al.*, 2013). So, it not only advantages for crop yield but it also have a significant negative impacts.

Farmers directly involved in the handling of pesticides and insecticides and are at a high risk of exposure to these through contact with pesticide residues on treated crops, unsafe handling, storage and disposal practices (Koureas *et al.*, 2014; Manyilizu *et al.*, 2017). They are using a large number of insecticides during the entire period of growth of vegetables, even at fruiting stage. Sometimes they also ignored the recommended waiting period between the harvest and last spray. Improve post harvest practices reduce food losses, increase food quality, food safety and also higher profit for the grower and marketers. So, improve post harvest management is a very important component in reducing production loss of vegetables. Knowledge, attitude and practice (KAP) survey is an essential tool to know the existing post harvest management and farmers views on safety and quality of vegetables.

KAP are the components of human behavior which is responsible for any action in dealing everyday life. These three components are somewhat pre-requisite in

¹Assistant Professor, Department of Agricultural Finance, Bangladesh Agricultural University (BAU), Mymensingh-2202, ²Scientific Officer, Agricultural Economics Division, Bangladesh Agricultural Research Institute (BARI), Gazipur-1701, Bangladesh.

adopting new knowledge on safe and quality vegetable production. Knowledge is the result of some activity such as generation, storage, dissemination and utilization of something that entails either information or data. It is usually based on learning, thinking, and proper understanding of the problem area (Azad, 2013). Attitude is defined by Ajzen and Fishbein (1980) as a person's degree of evaluative affect toward a target behavior. An individual may have multiple attitudes about an object, accessing different ones at different points in time (Wilson, 1998). Attitudes are relatively stable and once adopted, can provide a long-term effect (Olgyaiova *et al.*, 2005). Through changing attitude of farmers, it is possible to improve their performance in adoption and commercialization of horticultural products (Meena *et al.*, 2009).

A good number of researches on knowledge, attitude and practice of the farmers on different issues of crop production were carried out (Yuantari *et al.*, 2015; Azad *et al.*, 2014; Assis and Ismail, 2011; Muhammad *et al.*, 2012; Abbassy, 2017; Amponsah, *et al.*, 2018; Baksh *et al.* 2015; Adesuyi *et al.*, 2018; Mohamed *et al.*, 2018; Meena *et al.*, 2009) but unfortunately there is lack of information on KAP on safety, quality and post-harvest management of vegetables. Due to limited knowledge and information on these areas the present study was designed to demonstrate the status of tomato and brinjal grower's knowledge, attitude and current practices regarding safety, quality and post harvest management in some selected areas of Bangladesh. The study was conducted with a structured interview schedule in two Upazila from Jamalpur and Rangpur district of Bangladesh. They were selected based on intensive growing of tomato and brinjal. Total number of respondents was 100 taking 50 from each district.

Safety, quality and post-harvest management of tomato and brinjal cultivation

Farmers' knowledge

All the respondents under this study were using chemical fertilizers, insecticides, fungicides and pesticides. At the same time some farmers were using herbicides along with the chemical components as all they believe that these are mandatory for higher yield. These findings are similar to Zawiyah *et al.*, 2007 who indicated that insecticides were used by 98% of the farmers, followed by bactericides (79%), nematicides (24%), and herbicides (5%) and Mohamed *et al.*, 2018 who indicated that pesticides were indispensable for high crop yield (80%). Farmers were asked about the harmfulness of the chemical components used in brinjal and tomato cultivation. Among them 84.9% knew that these are very harmful. The study also found that 2.7% of the respondents still have no idea on the harmful effect of chemical components used in brinjal and tomato cultivation.

The knowledge level of brinjal and tomato farmer on safety, quality and post harvest management was shown by the following Table 1. It shows the number of respondents who answered the 18 statements as whether they know (Yes) means that they gave the correct answer or don't know (No) means that they gave

the false answer as previously done by Baksh et.al., (2015) and Yuantari et.al., (2015). It is evident from the mean frequencies that 74.61% of the sample farmers have sufficient knowledge on the safety, quality and post-harvest management of brinjal and tomato cultivation whereas the rest (25.39%) still unaware of this issue. Farmers had highest knowledge in response to “*Good management increases vegetables quality (100%)*”, “*The level of vegetables loss is more prominent for delay harvesting (98%)*”, “*Morning is the appropriate time for vegetable harvesting (98%)*” and “*The level of vegetable loss is more prominent at storage stage (96%)*”. Lowest knowledge was with respect to “*Idea on proper storage technique (32%)*” and “*It is very important to follow pre harvest interval rules (13%)*”.

Table 1. Farmers Knowledge on safety, quality and post harvest management of tomato and brinjal cultivation

Sl. No.	Statements	Extent of knowledge (% of respondents)	
		Yes	No
1.	Good management increases quality	100	0
2.	The level of loss is more prominent for delay harvesting	98	2
3.	Morning is the appropriate time for harvesting	98	2
4.	The level of loss is more prominent at storage stage	96	4
5.	Should collect after natural maturity	95	5
6.	Variety influences the post-harvest loss	93	7
7.	Should be free from disease	92	8
8.	Should be free from harmful insecticide and pesticide	85	15
9.	Good processing and packaging increases net revenue	79	21
10.	Large volume transport at a time increases post-harvest loss	76	24
11.	Idea on safety issues for human consumption	73	27
12.	Knowledge on sorting and grading	72	28
13.	Idea on optimum maturity	71	29
14.	Knowledge on pre and post-harvest handling	59	41
15.	Idea on proper transportation technique	58	42
16.	Should be washed after harvesting	53	47
17.	Idea on proper storage technique	32	68
18.	It is very important to follow pre harvest interval rules	13	87
	Summary (mean) knowledge	74.61	25.39

Source: Field survey, 2018.

Farmers Attitude

In order to measure farmers' attitude Table 2 enumerates ten statements on which farmers showed their opinions on two scales- agree and disagree as done by Yuantari *et al.* (2015). Majority of the respondents (82.78%) attitude was positive to the statement whereas 17.22% have negative attitude towards the statements means that they disagreed with the statement. Farmers agreed mostly with the statement, "Necessary to circulate more awareness building materials at the farmer level (100%)", "Ensuring the quality of insecticide and pesticide (100%)", "Should maintain proper management technique (96.8)" and "Use of pheromone trap and light trap (95.7)". Farmer were disagreed mostly with the statements "Use of bio pesticide and bio insecticide (50.7%)", "Pre harvest interval rules should follow (40.7%)" and "Clean the collected vegetables with hygienic water (37.5%)". It indicates that farmers have a strong believe on using chemical component to reduce insects and pests rather depend on bio pesticide and insecticide.

Table 2. Farmer's attitude towards safety, quality and post harvest management of brinjal and tomato cultivation

Sl. No.	Statements	Agree (%)	Disagree (%)
1.	Necessary to circulate more awareness building materials at the farmer level	100	0
2.	Ensuring the quality of insecticide and pesticide	100	0
3.	Should maintain proper management technique	96.8	3.2
4.	Use of pheromone trap and light trap to reduce insecticide and pesticide application	95.7	4.3
5.	Optimum use of chemical fertilizers	93.2	6.8
6.	Sources of pesticides and insecticides should be taken under strong monitoring	92.6	7.4
7.	Educate farmers on the optimum application of insecticide and pesticide	78.4	21.6
8.	Clean the collected vegetables with hygienic water	62.5	37.5
9.	Pre harvest interval rules should follow	59.3	40.7
10.	Use of bio pesticide and bio insecticide	49.3	50.7
	Summary (mean) attitude	82.78	17.22

Source: Field survey, 2018

Farmers Practices

Farmers practices has enumerated through Table 3. It shows seven practice statements of the study and farmers responses (%) as always, rarely and never as done by Yuantari *et al.* (2015). Majority (43.93%) of the respondents stated that they always practice these statements whereas a significant portion of the respondents (38.40%) opined that they never follow this statement in the cultivation of brinjal and tomato. Among the respondents 88.7% told that they timely apply quality pesticide and insecticide. But at the same time, 66.3% of the respondents always apply unnecessary insecticide and pesticide. This might be due to the knowledge gap of the farmers and their traditional attitude regarding safety and quality issues of brinjal and tomato cultivation.

Table 3. Farmer practices on safety, quality and post harvest management of brinjal and tomato cultivation

Sl. No.	Statements	Always (%)	Rarely (%)	Never (%)
1.	Farmer thinks about the safety and quality issue	10.8	22.6	66.6
2.	Farmer applies unnecessary insecticide and pesticide	66.3	8.5	25.2
3.	Farmer applies bio fertilizer and bio medicine	19.8	37.3	42.9
4.	Farmer uses pheromone trap, light trap and some other technology to destroy the harmful insect	53.4	28.7	17.9
5.	Farmer follows pre harvest interval rules	8.7	10.6	80.7
6.	Farmer timely applies quality insecticide and pesticide	88.7	2.3	9.0
7.	Farmer depends on natural maturity	59.8	13.7	26.5
	Summary (Mean) practices	43.93	17.67	38.40

Source: Filed survey, 2018

Attitude and perceptions towards safe and hygienic brinjal and tomato

Farmer attitude

Enumerates nine statements on farmers' attitude towards safe and hygienic tomato and brinjal. In each of the statements farmers showed their views as agree and disagree. Majority of the respondents (75.2%) showed positive attitude on the statements in Table 7. Farmers agreed mostly on "*Quality seed (100%)*", "*Variety should be high yielding (96.7)*" and "*Proper management of the crop*

field (92.3%)". Farmer showed disagreed on "Collected vegetables should be sun dried (65.4%)" and "Clean with fresh water (60.1%)".

Farmer perception

Farmers' perception towards safe and hygienic brinjal and tomato cultivation has enumerated in Table 4 where they answer in three different scales - always practice, rarely practice and never practice as done by Yuantari et.al. (2015). Most of the respondents were against the statements as maximum 40.93% never practiced during the cultivation of brinjal and tomato. Again 38.49% of the respondents had always practiced following by 20.58% as rarely practice in brinjal and tomato growing.

Table 4. Perception of brinjal and tomato farmers on safe and hygienic brinjal and tomato cultivation

Sl. No.	Statement	Always (%)	Rarely (%)	Never (%)
1.	Think about this issue	54.3	23.8	21.9
2.	Collect and sell quickly	86.0	14.0	0.0
3.	Cultivate high yielding variety	57.3	21.1	21.6
4.	Use bio fertilizer, insecticide and pesticide	12.2	21.7	66.1
5.	Follow pre harvest interval rules	15.9	31.4	52.7
6.	Make proper management of the crop field	89.4	8.6	2.0
7.	Clean with fresh water	14.5	15.7	69.8
8.	Clean with fresh piece of cloth	21.3	15.6	63.1
9.	Keep the collected tomato and brinjal in open sunlight	0.0	5.00	95.00
10.	Keep the collected tomato and brinjal in bare soil	34.0	48.9	17.1
	Summary (mean) perceptions	38.49	20.58	40.93

Source: Field survey, 2018

Tomato and brinjal farmers are practicing a good number of post harvest management. They had good level of knowledge and positive attitude towards safety and quality issues of tomato and brinjal. A significant number of tomato and brinjal growers were habituated with right practices regarding point of harvesting, packaging, transportation, grading, sorting and storing. They were well informed about the harmfulness of applying insecticide and pesticide in brinjal and tomato cultivation. Though they had enough knowledge on safety and

quality issues of tomato and brinjal but less than half of the farmers were practicing at farm level. So, still there is floor to improve their practices. In order to bridge the gap between knowledge and practice, new and update technology and information to improve their production performances should disseminate at farm level. Beside motivation training should follow up by the research institution and agricultural extension. This will be helpful for the farmer to come out of their normal trend of cultivation and enable them to use their knowledge without hesitation.

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