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# Survey on the abundance of major insect pests and diseases and their management approaches in different chilli growing areas of Jamalpur region

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#### Abstract

A study on the abundance of major insect pest(s) and disease(s) in chilli and their management approaches in different chilli growing areas of Jamalpur region was conducted during the period from May to September 2017. It is revealed from the study that 100% farmers opined that sucking insect pests (thrips and mite) and choanephora disease are considered to be mostly affected items in all the locations. On an average 6.57%, 10.61%, 44.94% and 53.46% famers indicated that chilli suffers from bacterial wilt, borer complex (*Spodopteralitura* and *Helicoverpaarmigera*), Fusarium wilt and cutworm, respectively. From the farmers' opinion, it clearly understood that chilli is a crop which is certainly to be attacked by sucking insect pests and choanephora disease. Farmers were misguided by the pesticide dealers to spray pesticides unnecessarily in chilli crops. Most of the farmers (88.86%) indicated that it is difficult to control chilli pests. A few farmers (11.14%) thought that it is controllable. Farmers spray pesticides with the interval of 2.61 days only and the total number of sprays was 43.58 in a season for chilli production. It is alarming that 86.13% farmers did not take any precaution measures during spraying time.

Keywords: Abundance, chilli insect pests and diseases, management approach, survey

# 1. Introduction

Chilli (*Capsicum frutescens*) is the most important spices crop in Bangladesh. Antioxidants are available in green chillies and they protect our body from free radical damage to give natural immunity to cancer. Green chillies are rich source of vitamin A and C and our ageing process becomes slowing down. Jamalpur is the major chilli growing area of Bangladesh. Among seven Upazillas of Jamalpur district, only the farmers of Madargonj Upazilla cultivate local "Baliguri" variety of chilli in 3000-3500 ha area of land. But recently farmers are facing a lot of problems to cultivate chilli. Major contributors to lower productivity are various insects and diseases. The typical damage in chilli known as "leaf curl syndrome" showing upward and downward curling is common due to infestation of different sucking insect pests (aphids, thrips and mites). Due to serious infestation economic yield loss may be 11-75% and 60-80% in respect of quantitatively and qualitatively <sup>[1]</sup>. Up to 50% yield loss may occur due to anthracnose disease caused by *Collectorichum* sp <sup>[2]</sup>.

Different sucking insect pests (mite, thrips, jassid, aphids) and caterpillars are the major problems for bumper chilli production <sup>[3]</sup>. Now, *Spodoptera litura* is a burning issue and extremely serious pest for chilli fruits. For controlling this pest, farmers of Jamalpur region are frequently spraying insecticides without any pre-harvest interval causing pest resistance, resurgence and environmental health hazard. Resistance to different insecticides (organophosphorus, carbamate, pyrethroids and some selected new products) of *Spodoptera litura* caused sporadic out breaks of the pest and serious crop damage <sup>[3-7]</sup>.

Different fungal, bacterial and viral diseases hamper chilli production. Considerable yield loss may occur due to major devastating fungal diseases such as damping off, choenaphora and anthracnose. Environment plays an important role for disease development. Inoculum of different soil-borne diseases grow rapidly in wet weather, high temperature and high humidity. Under ideal conditions fruit or leaf infection include water-soaked and necrotic lesions progress rapidly. Chilli production is hampered due to insects and diseases. Integration of different practices can manage diseases and insects effectively, economically and in a most environment friendly manner.

In order to promote the supply of safe green and red chilli for both domestic and export market

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from Jamalpur region, major emphasis is urgently needed to find out the major insects and diseases and their management approaches through a survey study. Findings from the survey may provide important information for the management of insect and disease in chilli. Quick dissemination of new IPM technologies and information generated through this study will help to motivate the chilli farmers for controlling major insects and diseases and to reduce the indiscriminate use of pesticides ensuring food security among the chillifarmers.

# 2. Materials and methods

A survey study was conducted in six chilli growing areas (Jamalpur Sadar, Madargonj, Islampur, Dewangonj, Melandah and Sherpur Sadar) in Jamalpur and Sherpur District to collect information on the abundance of major insect pests and diseases andtheir management approaches, use of different pesticides by the farmers in the study areas. A http://www.entomoljournal.com

fully structured objective oriented questionnaire was prepared. The questionnaire was refined with the knowledge of pre-survey experience and some ideas from surveys conducted by some authors [8-10]. The final version of the questionnaire covered most aspects of the use of pesticides in chilli field. Thirty farmers in each location were randomly selected for data collection and were interviewed during the period from May 2017 to September 2017. Information regarding major insect pests and diseases of chilli, pest management knowledge including pesticide names, application frequency and doses, insecticide application system and safety measures followed etc. were collected. Data were collected based on the pre-designed questionnaire. The collected data were compiled, calculated and average mean data were tabulated and presented in different Tables.



Fig 1: Talking with the farmers to collect information about chilli cultivation and its pest management

# 3. Results and discussion

Farmers' response regarding the major insect pest of chilli of six different regions is presented in Table 1. When farmers were asked regarding the major insect pest problems of chilli, 100% farmers opined that sucking pests (thrips and mites) are considered to be mostly affected insect pests in all the locations. On an average 3.21 to 100% of farmers indicated that chilli suffers from the different insect problem. On an average 3.41 to 23.68% farmers indicated that chilli suffers from the borer insect problem in fruiting stage. The highest percentage of farmers of Sherpur region (23.68%) mentioned the problem of borer in chilli cultivation. This might be the favorable environmental condition for developing their growth and development. In other regions some farmers indicated the problem of borer in chilli. 2.67 to 23.26% farmers opined that cutworm is problem in seedling stage. Farmers of Islampur, Dewangonj, Madargonj and Melandah cultivate chilli as broadcast method in char areas of Jamuna river and their crops are affected by the cutworm in the seedling stage. From the farmers' opinion, it clearly understood that chilli is a crop which is certainly attacked by different sucking insect pests.

Insects	% Farmers' respondent								
	Jamalpur	Madargonj	Islampur	Dewangonj	Melandah	Sherpur	Average		
Aphid	3.56	3.25	4.25	2.36	3.54	2.34	3.21		
Mites	100	100	100	100	100	100	100		
Thrips	100	100	100	100	100	100	100		
Borer	3.41	9.41	11.65	6.23	9.26	23.68	10.61		
Cutworm	3.31	17.53	23.26	21.24	13.56	2.67	53.46		

Table 1: The percentage of farmers' respondent to the insect problem in chilli at different regions

\*Mean value of 30 farmers in each location

In the study areas, some major diseases of chilli were *Fusarium* wilt, bacterial wilt, choanephora in maximum vegetative and flowering stage, fruit rot and dieback in fruiting stage (Table 2). Out of the five major diseases, all the farmers considered choanephra as the most important diseases

of chilli in Jamalpur region. On an average 31.61 to 55.68% farmers mentioned the problems of *Fusarium* wilt disease. They also highlighted that wilting and choanephora are not only common diseases but also most destructive ones.

**Table 2:** The percentage of farmers' respondent to the disease problem at different regions

Dicease	% Farmers' respondent								
Disease	Jamalpur	Madargonj	Islampur	Dewangonj	Melandah	Sherpur	Average		
Fusarium Wilt	46.37	44.35	55.68	46.38	31.61	45.27	44.94		
Choanephora	100	100	100	100	100	100	100		
Fruit rot	15.35	21.35	19.68	18.12	13.56	16.78	17.47		
Dieback	17.36	16.68	21.35	16.23	19.26	15.64	17.75		
Bacterial wilt	5.68	3.59	4.33	9.58	11.56	4.69	6.57		

\*Mean value of 30 farmers in each location

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# Farmers' opinion about the insect and disease management of chilli is presented in Table 3. All the farmers of six different study areas reported that sucking insect pests (thrips and mite) and choaneohora are the major problems of these areas and need to be controlled. Most of the farmers (88.86%) indicated that it is difficult to control. A few farmers (11.14%) opined that sucking pest and disease are controllable. There was no doubt that sucking pests and diseases caused tremendous yield loss of chilli. Each and every farmer is in support to adopt

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control measures. However, it is reflected from their opinion that the pest is difficult to control. Farmers have been experienced with the unsuccessful in controlling sucking pest and disease in chilli by spraying pesticides and are in agreement that the pest is difficult to control. Opinion of the few farmers (11.14%) those who mentioned that the pest is controllable should be taken into consideration for developing and implementation of better management technologies as the scope is there.



Fig 2: Farmers use a lot of pesticides for controlling major pests in chilli. Above inputs are collected from one chilli field

Table 3: Farmers'	opinion about the	management of chilli	sucking insect	pests and diseases
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Location	% Farmers' respondent					
Location	Need to control	Difficult to control	Controllable			
Jamalpur Sadar	100	91.21	8.79			
Madargonj	100	88.89	11.11			
Islampur	100	86.49	13.51			
Dewangonj	100	78.36	11.35			
Melandah	100	82.35	9.35			
Sherpur Sadar	100	86.25	14.35			
Average	100	88.86	11.14			

•Mean value of 30 farmers in each location

A large majority of farmers of different regions opined that the pesticides were used at interval less than recommended one. Farmers do not follow the recommendation of application of pesticides for controlling major insects and diseases in chilli. One of the reasons for not following the recommendation could be the failure in achieving the expected level of control. However, the concern about the hazardous effects of pesticide residues in chilli fruits and other environmental effects were not at all a matter of their consideration. Although farmers are using pesticides frequently even higher than the recommended dose, the damage reduction is not up to the expected. There might be several reasons for this partial success.

Spraying interval and the total number of spray followed by chilli farmers of different regions is presented in Table 4.

Farmers used to apply pesticides at different time intervals in different regions ranging from 1.89 to 3.25 days. In Jamalpur region, the average time intervals for spraying the chilli crop is 2.96 says. In dewangonj and Madargonj region, farmers followed spraying interval 1.89 and 2.01 days, respectively. The total number of spray varied from region to region ranging from 39.58 to 48.39 days. Farmers started to spray when the crop in the main field is about 30 days old. Thereafter the spraying continued for several months mostly at specific intervals and sometimes at scattered intervals. Majority of the farmers opined that the spraying continued up to the active fruit bearing stage which is usually three and half months in winter crop. During this three and half months time 39.58 to 48.39 times spray can occur depending on the regions.

Fable 4: Spraying pattern	of insecticide in	n chilli crop by the	armers of different	regions
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Location	Spraying interval (days)	Total number of spray
Jamalpur Sadar	2.96	39.58
Madargonj	2.01	45.33
Islampur	2.89	46.35
Dewangonj	1.89	48.39
Melandah	3.25	36.98
Sherpur Sadar	2.56	41.58
Average	2.61	43.58

•Mean value of 30 farmers in each location

The findings of the present study about the spraying of pesticides indicate that the farmers do not follow the recommendations rather they have developed their own style of spraying which is alarming for the human health and environment. Percentage of farmers' opinion about the precaution measures during the application of insecticide is presented in Table 5. On an average 86.13% farmers reported that insecticide is applied without any protection measures. Only 2.83% farmers used the musk to cover the face and 2.23% used musk and protective clothes during spraying. Only a very few farmers (1.03%) used eye glasses.

Table 5: The precaution measures used by the farmers during the application of pesticides in chilli

Proceetion	% Farmers' respondent							
Precaution	J Pur	M gonj	I Pur	D Gonj	M dah	S. Pur	Average	
Use of Mask	2.31	2.65	3.35	2.75	3.89	2.03	2.83	
Use of Musk and covering the body	1.32	1.25	3.25	2.45	2.78	2.32	2.23	
Use of eye glass	0.88	1.23	0.41	1.13	1.20	1.30	1.03	
No precaution measure	78.23	86.35	82.14	89.25	91.25	89.56	86.13	

\* Mean value of 30 farmers in each location, J Pur-Jamalpur, M gonj-Madargonj, D Gonj-Dewngonj, M dah-Melandah, S pur-Sherpur

Usually many farmers in different regions of Bangladesh use pesticides without any protection measures during spraying. Some of them occasionally were found to suffer from various illness symptoms. At the beginning of insecticide spraying, some farmers became senseless during spraying in the field. Sometimes pesticide contact caused irritation of body which developed the vomiting tendency. There might be many long term effects of body but farmers failed to give such type of information.

### 4. Conclusion

Some information on chilli cultivation, pest status, pest control practices, pesticide use pattern and precaution measures taken by the farmers have been collected from present survey experiment. Two major insect pests (thrips and mites) and diseases (Fusarium wilt and choanephora) have been reported as barrier of chilli production in Jamalpur region. Farmers were misguided by the pesticide dealers for controlling these pests through spraying without diagnosis the real problem. It is very important for the farmers to maintain the appropriate spraying schedule and dose with need based proper pesticides, spraying interval and to take all precaution measures during spray time.

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