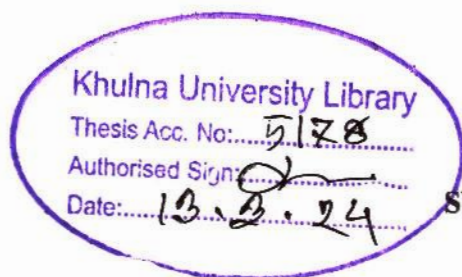


**KNOWLEDGE, ATTITUDE AND PRACTICE OF FARMERS REGARDING
EGGPLANT BACTERIAL WILT DISEASE**



A THESIS

BY

SWAGATA CHAKRABARTY

STUDENT ID. MS- 190810

**A Thesis (Course No. PLP-6104) Submitted to Agrotechnology Discipline in Partial
Fulfillment of the Requirements for the Degree of**

MASTER OF SCIENCE

IN

PLANT PATHOLOGY



AGROTECHNOLOGY DISCIPLINE

LIFE SCIENCE SCHOOL

KHULNA UNIVERSITY

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Approved as to Style and contents

By



**Prof. Md. Rejaul Islam
(Supervisor)**



**Prof. Dr. Mohammad Bashir Ahmed
(Co-Supervisor)**



**Prof. Dr. Sarder Safiqul Islam
(Chairman, Examination Committee
and
Head, Agrotechnology Discipline)**



**AGROTECHNOLOGY DISCIPLINE
LIFE SCIENCE SCHOOL
KHULNA UNIVERSITY
KHULNA -9208**

MAY, 2022

DEDICATED TO

MY BELOVED PARENTS



ABSTRACT

Bacterial wilt disease causes major crop yield losses and affect production in lower-income countries. The main purpose of the study was to evaluate the knowledge, attitude and practice of the farmers regarding bacterial wilt disease of eggplant to know their level of understanding. Data were collected from 60 eggplant farmers through face-to-face interview from selected villages of Dumuria upazila in Khulna district using an interview schedule during June 4 to June 7, 2022. All data were collected on ten characteristics of farmers selected for the study which were age, educational qualification, family size, farming experience, eggplant farming experience, farm size, annual income, organizational participation, extension media contact, agricultural training on eggplant farming. Majority (75%) of the farmers had medium knowledge followed by low knowledge (13.3%) and (11.7%) had high knowledge on bacterial wilt of eggplant. Most (45%) of the farmers had highly favorable attitude followed by moderately favorable attitude (26.7%) with (15%) farmers had very highly favorable attitude and (13.3%) of the farmers had low favorable attitude towards bacterial wilt of eggplant. Majority (68.3%) of the farmers had medium practice followed by high (28.3%) practice. However, a few (3.3%) of the farmers had low practice on eggplant bacterial disease. Among the selected ten characteristics of the farmers; family size, farming experience showed positive relationship with knowledge while family size, annual income and organizational participation showed positive relationship with their attitude toward bacterial wilt disease of eggplant. Level of education and extension media contract showed positive significant relationship with the practice of the farmers.

Key words: Wilt disease, Farmers' knowledge, attitude, practice

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The Author

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ACRONYMS	
KAP	Knowledge, Attitude and Practice
NS	Non-Significant
RO	Rank Order
SD	Standard deviation
BDT	Bangladeshi Taka

CHAPTER I

INTRODUCTION

1.1 Background of the study

Solanum melongena L. commonly known as brinjal or eggplant or aubergine is one of the vegetable crops belonging to solanaceae family. It is also a self-pollinated annual perennial vegetable extensively cultivated both in temperate and tropical zones of the world especially in Asian countries like India (Rahman et al., 2014). The name brinjal is popular in Indian subcontinents and is derived from Arabic and Sanskrit word whereas the name eggplant has been derived from the shape of the fruit of some varieties which are white and resemble in shape to chicken eggs. It is also called aubergine (French word) in Europe. Demand of eggplant as a fruit vegetable is increasing gradually all over the world because of its low price and high nutritive values (Lakshmi et al., 2013). Bacterial wilt disease of eggplant caused by *Ralstonia solanacearum* is a very deadly disease that can lead to the death of the whole plant. Eggplants productivity in most part of tropical Africa region had been seriously altered resulting to decline in food production due to the severe incidence of bacterial wilt disease (Adesina and Odekunle, 2012). In the field, bacterial wilt has been reported to be the most destructive disease with a severity of 10–90% (Ramesh, 2008). *Ralstonia solanacearum* generally invades plant roots from the soil through root injury or any natural openings to colonize the vascular system thus blocking translocation of water and nutrients. Consequently, wilt starts in the upper leaves followed by complete plant loss within a few days (Tahat and Sijam, 2010). Soil is the main source of infection of wilt; however, seeds and seedlings may also carry the pathogen (Sharma and Sharma, 2014).

To manage bacterial wilt of eggplant, multiple measures such as use of resistant cultivars, grafting seedlings with wild rootstock, crop rotation, soil fumigation, and chemical controls have been recommended. However, all those measures have limited success and adoption because they are difficult to apply under field condition (Vanitha et al., 2009). Eggplant may be produced in a wide range of soils, from light sandy to heavy clay soils that are deep, productive, and well drained. Eggplant is grown all the year round in Bangladesh and cover 1,29,419 acres with a

production of 5,30,610 MT with about 25.4% of the total vegetable area of the country (BBS, 2019). Eggplant is grown all over areas and seasons of Bangladesh, but intensively grown in winter season in Jashore, Mymensingh, Narsingdi, Bogura, Jamalpur, Dinajpur and Rajshahi districts of Bangladesh (Ramesh, 2008). It is being grown extensively in India, Pakistan, China, Philippines, France, Italy and United States. The nutritional value of eggplant is equivalent to that of tomatoes (Chaudhary, 1976). Dietary fiber, folate, ascorbic acid, vitamin K, niacin, vitamin B6, pantothenic acid, potassium, iron, magnesium, manganese, phosphorus, and copper are all found in eggplant (USDA, 2009). It is also used as a fresh vegetable and is believed to have therapeutic effects in the treatment of diabetic patients, asthma, cholera, bronchitis, diarrhoea, and other ailments (Tomar and Kalda, 1998). It's also been touted as a fantastic treatment for folks suffering from liver problems (Shukla and Naik, 1993). Crop loss due to diseases poses a great threat to Bangladesh agriculture. More than 454 diseases in about 100 cultivated crops have so far been recorded in Bangladesh (Anon, 2006). These massive losses have a negative impact on the country's overall yield and productivity. In most cases, the condition causes a 30-50 percent loss (Khan, 1999).

1.2 Statement of the problem

Several diseases damage eggplant, causing significant losses in productivity. Soils of Bangladesh by birth are healthy in which diversified crops can grow easily. The production of eggplant largely depends on the use of fertilizers, irrigation, pesticide etc. Calamities like disease, draught, flood etc. are a very regular phenomenon which hinders the production of agriculture to a great extent. Cultivable land is being decreased due to the pressure of massive population. To achieve self-sufficiency in eggplant production and farmer's betterment it is important to have proper knowledge, favorable attitude and use of proper management practices on eggplant. Most of the farmers in Bangladesh fail to overcome their problems (DAE, 2016). It is due to that they have lack of proper knowledge and conception about the situation. Because of the occurrence of distinct races, biotypes, or strains of the pathogen, the amount of crop and fruit losses attributable to a single disease differed from place to place (Sastry and Hegde, 1989). Diseases cause considerable harm to eggplant, with 15-20% in general and 30-50% in extreme cases (Das, 2002; Khan, 1999). This study was specifically designed to find out the answer of the following research.

- i. What are the knowledge, attitude and practice of the farmers about eggplant bacterial wilt?

- ii. What are the characteristics of the farmers?
- iii. Have any relationship between the selected characteristics of the farmer their KAP regarding eggplant bacterial wilt?

1.3 Objective of the study

Meaningful, accurate and obtainable objectives are an important part of research. The study was conducted with the following objectives

- i. To determine the knowledge, attitude and practice of the farmers about eggplant bacterial wilt disease
- ii. To analyse the selected characteristics of the respondents.
- iii. To explore relationship between the selected characteristics of the respondents and their KAP about eggplant bacterial wilt

1.4 Justification of the study

One of the most significant upazilas for eggplant growing and production is Dumuria. Large quantities of eggplant are delivered to the Khulna city market and regional markets. Though infections have caused a lot of problems for growers with eggplant. In Bangladesh, there have been several studies on the management of bacterial wilt disease. However, no research has been done on the KAP of farmers about eggplant bacterial wilt disease.

1.5 Limitations of the study

The present study was undertaken with a view to have an understanding of the knowledge, attitude and practice of the farmers regarding bacterial wilt disease of eggplant. In order to conduct the study in a meaningful and manageable way it becomes necessary to identify some limitations regarding to certain aspects of the study. Considering the time, money, labor and other necessary resources available to the researcher, the following limitations were observed throughout the study:

- i. The study was confined only to five villages under Batiaghata upazila in Khulna district so the whole figure of eggplant cultivation in this area could not be demonstrated.
- ii. Sample size of the study was limited



- iii. The study was limited to only eggplant bacterial wilt diseases whereas other diseases of eggplant were not considered.
- iv. Sometimes farmers were failed to identify diseases so that they could not able to give accurate information of the bacterial wilt diseases of eggplant.

1.6 Assumption the study

The following assumptions were in the mind of the researcher while conducting the study

- i. The respondents of the study area were capable of furnishing all available information stated in the interview schedule accurately.
- ii. The data collected from the respondents were free from bias and hesitation.
- iii. The response furnished by respondents was reliable and valid.

1.7 Definitions of some terms related to this study

Age: Age of the eggplant growers refers to the period of time from their birth to the time of interview.

Educational qualification: Education was defined in terms of formal education of a respondent. It was operationalized by the number of years spent to acquire formal education.

Family size: It means the number of family members who ate together and live under the same roof.

Experience in farming: Experience of a respondent was measured by the length covered from his stating years in agricultural activities till to the date of interview.

Experience in eggplant cultivation: Experience in eggplant cultivation of a respondent was measured by the length covered from his stating years in eggplant cultivation till to the date of interview.

Farm size: Farm size refers to the farmer's area of ownership and area under organic farming in hectare.

Annual income: The annual income referred to the income of a respondent earned from different sources viz. crop farming, livestock rearing, fisheries, business, service, day laborer and others.

Organizational participation: Organizational participation referred to the involvement of the respondents in different organizations.

Extension Contact: It refers to use different information sources such as TV, radio, DAE officers and other agricultural agents etc.

Training: It was based on mainly receiving of any training on vegetable cultivation specially in eggplant cultivation.

Disease: A disorder of structure or function in a human, animal, or plant, especially one that produces specific symptoms or that affects a specific location and is not simply a direct result of physical injury.

CHAPTER II

REVIEW OF LITERATURE

The chapter deals with the review of relevant literature of the present study. The first section dealt with reviews related to KAP, the second one dealt with literature review relevant to relationship between the selected characteristics of the respondents and their KPA. The last section dealt with the conceptual framework of the study.

2.1 Reviews Related to Knowledge, Attitude and Practice

2.1.1 Reviews Related to Knowledge

Akther (2003) conducted a study, on comparison between knowledge and skills of women led Farmer Field School (FFS) of RDRS and non-Farmer Field School farmers and found that almost three fourth (77.78 percent) of the FFS farmers had medium knowledge category and only 11.11 percent had poor and the same percent had high knowledge categories. On the other hand, all (100 percent) of the non FFS farmers fell in the poor knowledge Category and no farmers were under medium and high knowledge categories.

Farhad's (2003) study revealed that majority (68 percent) of the women farmers had medium knowledge on IPM in vegetable cultivation compared to 17 percent had low knowledge and 15 percent high knowledge.

Sana (2003) in his study on farmer's knowledge of shrimp cultivation found that majority (61 percent) of the shrimp farmers had medium Knowledge following 30 percent who possessed low knowledge and a few of them (9 percent) had high knowledge. In his study, most (91 percent) of the respondents had low to medium level of knowledge. A similar finding was found by Rahman (2001) and Saha (2001) in their respective Studies.

Shaha (2003) in his Study on knowledge and training needs of the farmers for system of rice intensification programme of CARE-RIDS found that most (86 percent) of the farmers possessed medium knowledge while 14 percent of them possessed high knowledge.

Hossain (2003) found that majority (66 percent) of the farmers had medium knowledge on modern boro rice cultivation practices compared to 17 percent having both low knowledge and high knowledge. The study also indicates that the most (83%) of the, farmers were in medium knowledge to high knowledge categories.

Marnun's (2002) study revealed that the majority (52.8 percent) of the farmers possessed moderate knowledge on quality rice seed production and preservation while about one-fourth (24.7 percent) possessed poor knowledge and above one-fifth (22.5 percent) possessed good knowledge.

Islam (2002) made a study on proshika famers knowledge and adoption of ecological agricultural practices and found that majority (57.69 percent) of the Ghatail (one of a selected locate) farmers possessed low knowledge and 38.46 percent and 3.85 percent farmers possessed medium and high knowledge respectively while highest proportion (43.75 percent) of Madhupure (another selected local) farmers possessed moderate level knowledge and 41.67 percent and 14.38 percent farmes possessed low and high knowledge in ecological agriculture. A significant t-value (1.511) also clearly indicated that Madhupur famers possessed more knowledge in ecological agriculture than Ghatail counterparts.

Alam (2002) conducted a study on compárative analysis between knowledge and skill of the beneficiaries under two training strategies (Spot training and residential training) of RDRS and revealed that beneficiaries of both type of training differed significantly in respect of their Knowledge on training strategies. In case of Spot training, 58.34 percent beneficiaries had high knowledge, 45 percent had medium knowledge and 1.66 percent had poor knowledge. The findings also revealed that knowledge of the beneficiaries of spot training were higher than residential training.

Sarker (2004) observed that majority or three-fifth (60 percent) of the famers possessed medium knowledge on BRRI Dhan 29 while about one third (33 percent) of them possessed high knowledge and 7 percent had low knowledge. His findings showed that an overwhelming majority (93 percent) of the farmers possessed medium to high level of knowledge.

Mannan (2001) in his study on knowledge about food and nutrition of the farmers under Proshika found that three-fourth (75 percent) of the respondents fell in the medium knowledge category, while about one-tenth (9 percent) of them fell in low knowledge and about one-sixth (16 percent) fell in the high knowledge category. This means that overwhelming majority, (91 percent) of the respondents had medium to high level of knowledge about flood and nutrition.

2.1.2 Reviews related to attitude

Sarker's (2002) study revealed that majority (62.37 percent) of rice growers had moderately unfavorable attitude towards the use of Di-ammonium phosphate (DAP) while 26.75 percent having moderately favorable attitude and 5.94 percent fell in highly favorable and only 4.95 percent fell in highly unfavorable attitude towards the use of DAP.

Haque (2002) observed that highest proportion (41.88 percent) of the farmers possessed moderately favorable attitude towards extension activities of DAE while about one-third (32.48 percent) of them had moderately unfavorable attitude towards the same. Again, 14.53 percent farmers showed strongly unfavorable attitude towards extension activities of DAE while 6.84 percent respondents possessed strongly favorable attitude towards the same. Only 4.27 percent of the farmers had neutral attitude towards extension activities of DAE. The mean value indicated that overall attitude of the farmers was slightly favorable towards DAE.

Khan (2002) found that more than half (58 percent) of Proshika beneficiaries had moderately favorable attitude, while about 20 percent had highly favorable attitude towards programme. The proportion of the beneficiaries having moderately unfavorable attitude was 18 percent. The attitude of 4 percent of beneficiaries were neutral. Thus a great majority (77.5 percent) of the beneficiaries possessed favorable attitude towards social forestry programme of proshika.

Siddique (2002) in his study on attitude of farmers towards improved winter vegetable production found that majority (64.35 percent) of the vegetables growers had moderately favorable attitude towards improved winter vegetable production while 25.74 percent had slightly favorable attitude and only 9.90 percent fell in the highly favorable attitude category. He also found that the majority (about 74 percent) of the vegetable growers showed medium to high favorable attitude.

Haque's (2002) study on attitude of rural women towards homestead agriculture in a selected area of Panchagarh district found that the most of the rural women had moderate favorable attitude in each of the five selected activities. These were 83, 78, 72 and 70 percent in poultry raising, goat rearing, fish cultivation, tree plantation and vegetable cultivation respectively.

Sadat (2002) in his research found that majority (72 percent) of the Proshika beneficiaries possessed a highly favorable attitude towards Proshika, while one-fifth (20 percent) of them possessed a moderately favorable attitude and only few beneficiaries had unfavorable attitude towards Proshika. In case of non-beneficiaries of Proshika, about one-third (32 percent) of the respondents possessed moderately favorable attitude towards Proshika which was followed by moderately unfavorable attitude (26.67%), highly favorable attitude (21.33%), highly unfavorable attitude (13.33%) and neutral attitude (6.67%).

Afrad's (2002) Study revealed that about three-fifth or majority (59.1 percent) of the farmers had favorable attitude towards vegetable cultivation while two fifth (40.9 percent) of them had moderately favorable attitude towards vegetable cultivation.

2.1.3. Review of Studies Related to the Use of Different Practices

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. The study revealed that majority (69 percent) of the farmers had medium adoption while 13 and 18 percent had low and high adoption of modern agricultural technologies respectively.

Rahman's (2001) study revealed that three-fourth (75 percent) of farmers fell under the medium adoption while 18 and 7 percent had high and low adoption in Aalok-6201 hybrid rice cultivation respectively.

Hussen (2001) reported that most (91%) of the respondents had medium adoption of modern sugarcane cultivation practices compared to 7 percent having low and only 2 percent having high adoption of modern sugarcane cultivation.

Rahman's (1999) study revealed that majority (71 percent) of the respondents had medium adoption compared to 29 percent having below optimum adoption and there was no respondent at all who adopted the fertilizer at above optimum level.

Podder (1999) found that about half (47 percent) of the respondents had medium adoption compared to 14 and 39 percent having low and high adoption respectively.

Sarkar (1997) observed that more than half or majority (55 percent) of the respondents had medium adoption compared to 23 percent having low adoption and 22 percent having high adoption of improved potato cultivation practices.

Chowdhury (1997) reported that majority (58 percent) of the respondents had no adoption of BINA technologies but 42 percent of them adopted BINA technologies.

Alam's (1997) study revealed that half (50 percent) of the respondents had low use of farm practices followed by medium use (43%). Only a few (7 percent) of them had high use of improved practices.

Hasan (1996) found in his study that the highest proportion (44 percent) of the respondents perceived the existence of medium adoption, compared to high adoption (30%) and low adaptation (26%) in respect of selected agricultural technologies.

Muttalab's (1995) study revealed that about half (49%) of the potato growers had low adoption of improved technologies, compared to medium (43%) and high (8%) adoption.

Akanda (1995) found that 36.64, 11.88, 6.93 and 2 percent of the respondents used recommended dose of urea, TSP, MP and gypsum in their potato cultivation.

Khan (1993) observed that among the respondent farmers, 7 percent had no adoption while 57 percent had low adoption, 32 percent had medium adoption and only 4 percent had high adoption of insecticides.

Hoque's (1993) study revealed that highest proportion (37%) of the respondents had medium adoption while 32 and 31 percent had low and high adoption of improved practices in sugarcane cultivation.

Singh et al (1992) found that majority of sugarcane growers had the medium level of adoption and were partial adopters of scientific recommendations of sugarcane production technology.

Juliana et al (1991) found that half (50 percent) of marginal farmers, 47.50 percent of small farmers and majority (52.50 percent) of large farmers had medium adoption and 42.50 percent of large farmers, 22.50 percent of small farmers and 5 percent of the marginal farmers had high level of adoption. In both cases large farmers participation in adoption was higher in comparison to other categories of respondent farmers.

Hossain (1991) found that more than half or majority (52 percent) of growers adopted of improved farm practices at medium extent compared to 34 percent having low adoption and only 14 percent high adoption.

2.2 Studies related to the relationship between the selected characteristics of the farmers and their KAP

2.2.1 Selected characteristics and knowledge

2.2.1.1 Age and knowledge

Ahmed et al (2009) found a negative but non-significant relationship between age and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between age of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.2 Education and knowledge

Ahmed et al (2009) found a significant relationship between education and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between education of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.3 Experience in farming and knowledge

Ahmed et al (2009) found a negative but significant relationship between experience in farming and knowledge in integrated farming.

2.2.1.4 Experience of eggplant farm and knowledge

Ahmed et al (2009) found a negative but significant relationship between experience in integrated farming and knowledge in integrated farming.

2.2.1.5 Family size and knowledge

Ahmed et al (2009) found a negative but significant relationship between family size and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between family size of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.6 Farm size and knowledge

Ahmed et al (2009) found a non-significant relationship between farm size and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between farm size of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.7 Annual income and knowledge

Ahmed et al (2009) found a significant relationship between annual income and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between annual income of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.8 Organizational participation and knowledge

Ahmed et al (2009) found a significant relationship between organizational participation and knowledge in integrated farming.

Ahmed and Hossain (2018) found a significant relationship between organizational participation of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.9 Extension media contact and knowledge

Ahmed et al (2009) found a significant relationship between extension media contact and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between knowledge of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.1.10 Training and knowledge

Ahmed et al (2009) found a significant relationship between training and knowledge in integrated farming.

Ahmed and Hossain (2018) found a non-significant relationship between training of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

2.2.2 Selected characteristics and attitude

2.2.2.1 Age and attitude

Ahmed et al (2009) found a positive but non-significant relationship between age and attitude in integrated farming.

Islam (2018) found a non-significant relationship between age and attitude in organic farming.

2.2.2.2 Education and attitude

Ahmed et al (2009) found a non-significant positive relationship between education and attitude in integrated farming.

Islam (2018) found a negative but non-significant relationship between education and attitude in organic farming.

2.2.2.3 Experience in farming and attitude

Ahmed et al (2009) found a negative but non-significant relationship between experience in farming and attitude in integrated farming.

Islam (2018) found a significant relationship between experience in farming and attitude in organic farming.

2.2.2.4 Experience in eggplant farming and attitude

Ahmed et al (2009) found a negative but non-significant relationship between experience in integrated farming and attitude in integrated farming.

Islam (2018) found a significant relationship between experience in organic farming and attitude in organic farming.

2.2.2.5 Family size and attitude

Ahmed et al (2009) found a negative significant relationship between family size and attitude in integrated farming.

Islam (2018) found a non-significant relationship between family size and attitude in organic farming.

2.2.2.6 Farm size and attitude

Ahmed et al (2009) found a positive significant relationship between farm size and attitude in integrated farming.

Islam (2018) found a non-significant relationship between farm size and attitude in organic farming.

2.2.2.7 Annual income and attitude

Ahmed et al (2009) found a positive but non-significant relationship between annual income and attitude in integrated farming.

Islam (2018) found a non-significant relationship between annual income and attitude in organic farming.

2.2.2.8 Organizational participation and attitude

Ahmed et al (2009) found a positive significant relationship between organizational participation and attitude in integrated farming.

Islam (2018) found a non-significant relationship between organizational participation and attitude in organic farming.

2.2.2.9 Extension media contact and attitude

Ahmed et al (2009) found a positive significant relationship between extension media contact and attitude in integrated farming.

Islam (2018) found a negative but non-significant relationship between extension media contact and attitude in organic farming.

2.2.2.10 Training and attitude

Ahmed et al (2009) found a positive but non-significant relationship between training and attitude in integrated farming.

Islam (2018) found a non-significant relationship between training and attitude in organic farming.

2.2.3 Selected characteristics and practice

2.2.3.1 Age and practice

Ahmed et al (2009) found a positive but non-significant relationship between age and practice in integrated farming.

Islam (2018) found a non-significant relationship between age and practice in organic farming.

2.2.3.2 Education and practice

Ahmed et al (2009) found a positive but non-significant positive relationship between education and practice in integrated farming.

Islam (2018) found a negative but non-significant relationship between education and practice in organic farming.

2.2.3.3 Experience in farming and practice

Ahmed et al (2009) found a positive but non-significant relationship between experience in farming and practice in integrated farming.

Islam (2018) found a non-significant relationship between experience in farming and practice in organic farming.

2.2.3.4 Experience of eggplant farming and practice

Ahmed et al (2009) found a negative but non-significant relationship between experience in integrated farming and practice in integrated farming.

Islam (2018) found a non-significant relationship between experience in organic farming and practice in organic farming.

2.2.3.5 Family size and practice

Ahmed et al (2009) found a negative but non-significant relationship between family size and practice in integrated farming.

Islam (2018) found a non-significant relationship between family size and practice in organic farming.

2.2.3.6 Farm size and practice

Ahmed et al (2009) found a positive significant relationship between farm size and practice in integrated farming.

Islam (2018) found a non-significant relationship between farm size and practice in organic farming.

2.2.3.7 Annual income and practice

Ahmed et al (2009) found a positive significant relationship between annual income and practice in integrated farming.

Islam (2018) found a non-significant relationship between annual income and practice in organic farming.

2.2.3.8 Organizational participation and practice

Ahmed et al (2009) found a positive significant relationship between organizational participation and practice in integrated farming.

Islam (2018) found a negative but non-significant relationship between organizational participation and practice in organic farming.

2.2.3.9 Extension media contact and practice

Ahmed et al (2009) found a positive significant relationship between extension media contact and practice in integrated farming.

Islam (2018) found a positive but non-significant relationship between extension media contact and practice in organic farming.

2.2.3.10 Training and practice

Ahmed et al (2009) found a positive but non-significant relationship between training and practice in integrated farming. Islam (2018) found a negative non-significant relationship between training and practice in organic farming.

2.4 Conceptual Framework of the Study

In scientific research, the conceptual framework is selecting and measuring variables. A properly constructed research hypothesis contains a "dependent variable" and "independent variable." This study is concerned with knowledge, attitude and practice of farmers regarding eggplant

bacterial wilt disease. So, knowledge, attitude and practice were the study's dependent variables. It is impossible to deal with all the variables in a single study. After consulting with the relevant experts and reviewing past related literature, ten selected characteristics of the farmers ' were considered for the study as the independent variables.

The conceptual framework of the study, has been formulated as shown in figure 2.4.

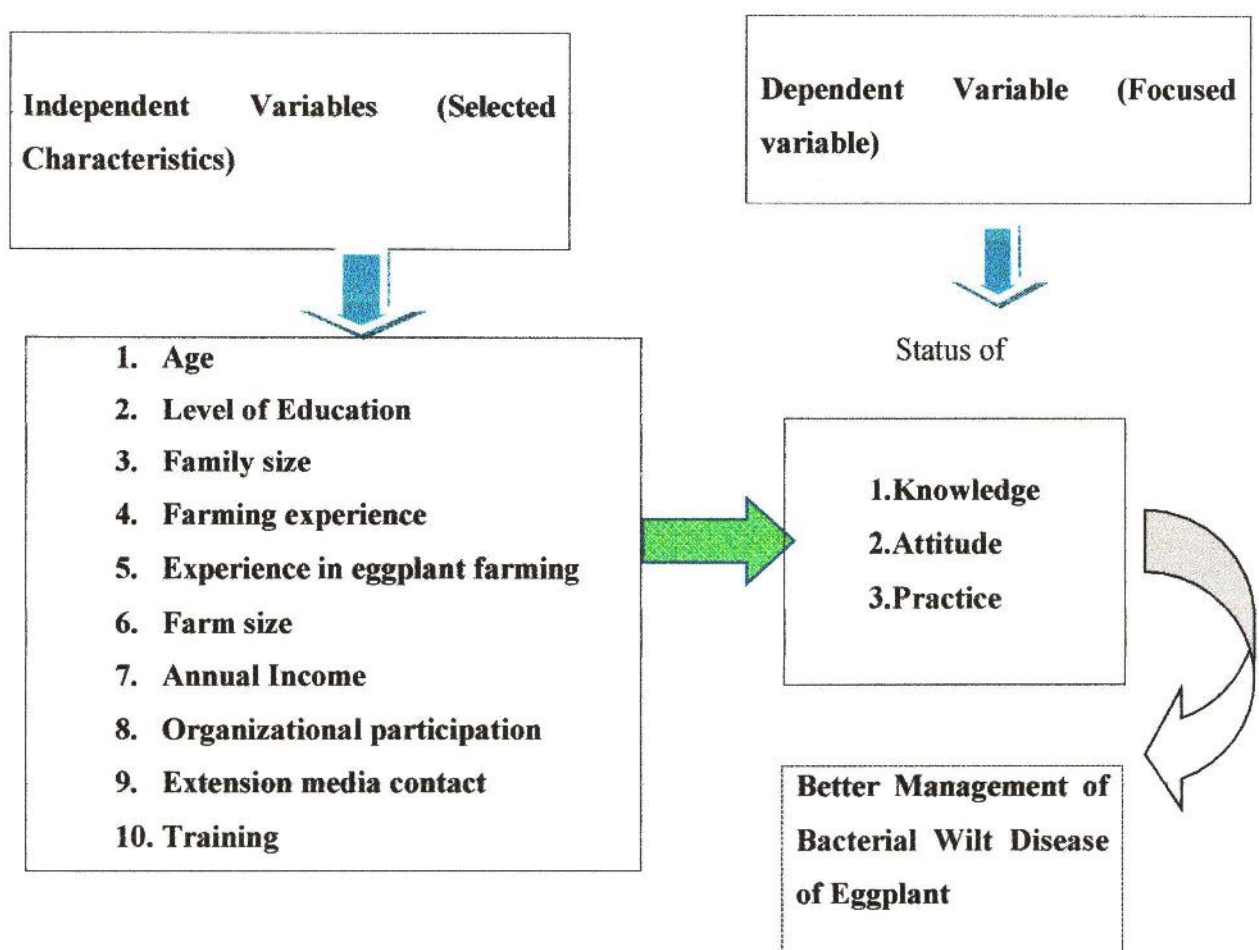


Fig. 2.4: Conceptual model showing relationship between knowledge, attitude, practice and their selected characteristics (Independent Variables)

CHAPTER III

METHODOLOGY

In scientific study, methodology is a very important factor to consider. The importance of methodology in any research project cannot be overstated. The research would be able to collect genuine data and make accurate judgments with the help of methodology. Keeping this in mind, the researchers made every effort to use suitable methodologies throughout the experiment. Research methodology is a systematic way to solve a research problem. It may be understood as a science of studying how research is done (Kothari, 1990). The present study was a field survey on the incidence of eggplant (*Solanum melongena* L.) diseases at Dumuria upazila of Khulna district. The methods and procedures followed in conducting this study have been discussed in this chapter.

3.1 Design of the study

This study was based on descriptive and diagnostic research design (Kothari, 1990). It was designed to study the KAP of the farmers about eggplant bacterial wilt disease.

3.2 Locale of the study

The study was conducted in purposely selected three villages namely; Kulbaria, Gobindokathi, Boratia at Dumuria upazila under Khulna district. The Upazila is situated under the same Agro-Ecological Zone (AEZ) of the Ganges Tidal Flood Plain (Anonymous, 1988). Besides it is known to us eggplant growing area, plays an important role in local market in Khulna city. Map of district Khulna showing Dumuria is presented in Figure 3.1

3.3 Population and Sampling Design

All the farmers of the selected three villages who were involved in the cultivation of eggplant constituted the population of the study. A number of 60 farmers taking 20 from each of the villages were selected following accidental randomly sample method. Thus the sample size stood 60.

Table 3.1 Distribution of population in the study area

Upazila	Village	Sample
Dumuria	Kulbaria	20
	Gobindokathi	20
	Boratia	20
Total		60

3.4 Research Instruments

An interview schedule with pictorial print of diseases of eggplant was used as the research instrument in order to collect relevant information from the eggplant growers. The interview schedule was prepared for data collection in Bangla keeping the objectives of the study in view. The interview schedule contained both closed and open ended questions. Considering the selected characteristics of the respondents, easy, simple, direct questions and different scales were included in the schedule to obtain necessary information. Based upon the pretest experience, necessary correction, addition, alteration and re-arrangement were made in the interview schedule before it was run for final data collection.





Figure 3.1: Map of Dumuria upazila

3.5 Methods and Time of Data Collection

The data were collected through personal interview by the researcher himself during 4 June, 2022 to June 7, 2022. The researcher took every attempt to clarify the goal of the study to the respondents in order to obtain valid and reliable data. With the use of a visual print of eggplant disorders, interviews were held with respondents in their fields. Before beginning an interview with any respondent, the researcher establish support with them and explains the study's aims in as much local language as possible. As a result, the respondents furnished proper responses to the questions and statements without hesitation.

as much local language as possible. As a result, the respondents furnished proper responses to the questions and statements without hesitation.

3.6 Selection and Measurement of the Variables

3.6.1 Selection of variables

The investigator looked into the literature in this chapter to have a better grasp of the nature and extent of the variables in the investigation. Any attribute that may take on varied or distinct values in different instances is referred to as a variable (Ezekiel and Fox, 1959). At least two relevant variables, an independent and a dependent variable, are included in a well-organized study. An independent variable is a variable that is changed to determine the link to a phenomena. As the experiment introduces, eliminates, or modifies the independent factors, the dependent variable changes (Townsend, 1953). The specification and measurement of variables is a crucial effort in any research. Some of the respondents' personal and demographic characteristics were included as independent variables in the study. The characteristics were age, educational qualification, family size, experience in farming, experience in eggplant cultivation, farm size, annual income, organizational participation, extension media contact and training. The dependent (focus) variable of the study was KAP (Knowledge, Attitude and Practices) of the farmers selected characteristics about eggplant bacterial wilt disease.

3.6.2 Measurement of independent variables

3.6.2.1 Age

The age of the respondents was measured in terms of actual years from his/her birth to the time of interviewing. The respondents were asked directly about their age. It appears in item no. 1 of the interview schedule (Appendix A). The respondents were classified into different categories according to their age as shown in Table 3.2

Table 3.2 Categories of the respondents according to their age

Categories	Score (years)
Young aged	<35
Middle aged	36-50
Old aged	>50

3.6.2.2 Educational qualification

Educational qualification was defined in terms of formal education of a respondent. It was measured by the number of years spent to acquire formal education. A score of one was given to the respondent for one year of schooling. Besides a score of '0' was given to the respondent who had no formal education and could not read and write. For example, a score of 5 was also given to the respondents who passed class five. Besides, a score of one (01) was given to the respondent who can sign his name. It appears in item no.5 in the interview schedule (Appendix A). The respondents were classified into following categories according to educational qualification as shown in Table 3.3

Table 3.3 Categories of the respondents according to their educational qualification

Category	Score (Years of schooling)
Illiterate	0
Primary	1-5
Secondary	6-10
Higher secondary	11-12
Graduate/Above higher secondary	13-16

3.6.2.3 Family Size

The family size of a respondent was measured by the total number of his family members including himself, his wife, children and other dependents that were eating and staying together. This variable has been shown in the question no. 3 of the interview schedule (Appendix-A).

Based on family size, the respondents were classified into different categories as shown in Table 3.4.

Table 3.4 Categories of the respondents according to their family size

Categories	No of family members
Small sized family	1 - 4
Medium sized family	5 -6
Large sized family	≥ 7

3.6.2.4 Experience on farming

Experience on farming of the respondents were measured by the length covered from his stating years in cultivation to the time of interview on the basis of his statement. A score of one (1) was assigned for each year of his farming experience. It appears in item No. 4 of interview schedule (Appendix A).The respondents were grouped into different 4 categories based on experiences in farming.

Table 3.5 Categories of respondents according to their experience in farming

Categories	Score (years)
Low experience	10
Medium experience	11 – 20
High experience	> 20

3.6.2.5 Experience on eggplant cultivation

Experience on eggplant cultivation the respondents were measured by the length covered from his stating years in eggplant cultivation to the time of interview on the basis of his statement. A score of one (1) was assigned for each year of his eggplant cultivation experience. It appears in item No. 5 of interview schedule (Appendix A).The respondents were grouped into different 4 categories based on experiences for eggplant farming.

Table 3.6 Categories of respondents according to their experience on eggplant cultivation

Categories	Score (years)
Low experience	10
Medium experience	11 - 20
High experience	> 20

3.6.2.6 Farm Size

Actual size of the farm was considered as the score of the farm size. For example, if a respondent had 0.05 ha of land then his score was 0.05. The data were first recorded in local unit and then converted to hectare (question no. 7 of the interview schedule). Based on farm size, the respondents were classified into five categories as shown in Table 3.7

Table 3.7 Categories of respondents according to their farm size

Categories	Score (ha)
Landless farmers	<0.02
Marginal farmers	0.02 -0.20
Small farmers	0.21- 1.0
Medium farmers	1.01-3.0
Large farmers	>3

3.6.2.7 Annual income

The yearly income referred to the income of a respondent earned from different sources viz. crop farming, livestock rearing, fisheries, business, service, day labourer and others. The question to measure annual income of the respondents has been shown in the item No. 6 in the (question no. 6 of the interview schedule). (Appendix A). The respondents were classified into following categories according to annual income as shown in Table 3.8

Table 3.8 Categories of respondents according to their family annual income

Categories	Taka (BDT)
Low income	< 1,50,000
Medium income	1,50,000-3,00,000
High income	>3,00,000

3.6.2.8 Organizational participation

Organizational participation of a respondent was measured on the basis of number of organization he/she involved and his/her position in particular organization. For example, if a respondent involved in one organization his organizational participation score is accordingly as no involvement (0), general member (1), executive member (2) and executive officer (3). Based on organizational participation scores, the respondents were grouped into following categories as shown in Table 3.9.

Table 3.9 Categories of the respondents according to their organizational participation

Categories	Score
No participation	0
Low participation	1 -5
Medium participation	6 - 10
High participation	>10

3.6.2.9 Extension media contact

In this study, the extension media contact score was computed for each respondent on the basis of the extent of his contact with selected media as ascertained from his responses to item No. 9 in the interview schedule (Appendix A). Each respond was asked to indicate the extent of his contact with its extension such as often, sometimes, seldom and never and a score of 3, 2, 1 and

0 was assigned to these categories respectively. Based on extension media contact score, the respondents were grouped into four categories as shown in Table 3.9

Table 3.10 Categories of respondents according to their extension media contact

Categories	Score
Low contact	1-8
Medium contact	9 -16
High contact	17 – 24
Very high contact	>24

3.6.2.10 Training exposure

Farmers training score was determined by the number of training s/he received by without considering duration of training. Based on training score, the respondents were classified into following categories as shown in Table 3.11.

Table 3.11 Categories of respondents according to their training exposure

Categories	Score (no of training)
No training	0
Low training	1
Medium training	2
High training	3

3.6.3 Measurement of Dependent / Focus Variable

Knowledge, Attitude and Practice were the dependent variable of the study. Measurement procedure of the variable are discussed below.

3.6.3.1 The Knowledge level of the respondents about eggplant bacterial wilt disease.

To determine knowledge of the respondents about eggplant bacterial wilt disease, a number of 12 questions were incorporated in item no.11 of the interview schedule (Appendix A).Each of the question was assigned a score of 2 (two).Thus the total number was 12. Each of the respondents

was asked to answer the twelve (12) questions. The obtained score of a respondent was determined by adding all the scores obtained score against the 12 questions. Based on the obtained score, the respondent were grouped into following categories as shown in Table 3.12.

Table 3.12 Categories of the respondents according to their knowledge

Categories	Score
Low knowledge	Upto 8
Medium knowledge	9-16
High knowledge	>16

3.6.3.2 Attitude of the respondents towards the eggplant bacterial wilt disease

To determine the attitude of the farmers, a number of 12 attitudes were included in the item 12 of interview schedule (Appendix A).A 5 point rating scales such as highly agree, agree, undecided, disagree, highly disagree were employed against 12 statements related attitude about eggplant bacterial wilt disease .As a score of 5,4,3,2 and 1 were assigned against each of the rating scales respectively. Each of the respondents was asked to rate their responses against the 12 statements with their extent of attitudes. The practice score of a respondent was calculated by adding all the obtained scores against the 12 attitudes. The attitude score of a respondent could varied from 12 to 60 where 12 indicate very low attitude while 60 indicate very high attitude. Based on the attitude score, the respondent were classified into different categories as shown in Table 3.13

Table 3.13 Categories of respondents according to their attitude

Categories	Scores
Very less favorable attitude	Upto 12
Low favorable attitude	13-24
Moderately favorable attitude	25-36
High attitude	37-48
Very high favorable attitude	49-60

3.6.3.3 Practice of the respondents towards the eggplant bacterial wilt disease

To determine the practice of the farmers, a number of 12 practices were included in the item 13 of interview schedule (Appendix A). A 4 point rating scales such as regularly, sometimes, rarely and not at all were employed against 12 statements related practice about eggplant bacterial wilt disease. As a score of 3, 2, 1 and 0 were assigned against each of the rating scales respectively. Each of the respondents was asked to rate their responses against the 12 statements with their extent of practices. The practice score of a respondent was calculated by adding all the obtained scores against the 12 practices. The practice score of a respondent could varied from 0 to 36 where 0 indicate no practice while 36 indicate high practice. Based on the practice score, the respondent were classified into different categories as shown in Table 3.14

Table 3.14 Categories of the respondents according to their practice

Categories	Score
Low practice	Upto 12
Medium practice	13-24
High practice	>24

3.7 Data processing and analysis

Collected data were compiled, coded, tabulated for processing and analysis in accordance with the objectives of the study. For arriving at a meaningful conclusion, tabular presentation of data was intensively used. The SPSS-16 computer package program was used to analyze the data. Descriptive statistics like number, percentage, range, mean and standard deviation were used in describing selected variables of the study. To explore relationship, Pearson Product Correlation Coefficient (for interval and ratio type of data) and in some cases Spearman Rank Correlation Coefficient (for ordinal type of data) were used. Data analysis was done using the concerned software Statistical Package for Social Science. The SPSS program is quite good and useful for recording, categorizing, tabulation and computing various simple statistics MS Excel, statistical software was also used for graphical presentation of data.

CHAPTER 4

RESULTS AND DISCUSSION

Data were collected from the respondents and were carefully accomplished, coded, computed, tabulated and analyzed in accordance with the objectives of the study. After completion of those processes this chapter was written carefully. The findings of the study and logical interpretations of the results have been presented under four sections in this chapter. Section 4.1 dealt with KAP (Knowledge, Attitude and Practices) while section 4.2 and 4.3 dealt with the facts on selected characteristics and relationship between the selected characteristics and the KAP. The final section 4.4 was concerned with the approaches used by the farmers for making free eggplant from bacterial wilt disease.

4.1 Knowledge, Attitude and Practices of the Respondent Farmers Regarding Eggplant Bacterial Wilt Disease

4.1.1 Knowledge of the respondents regarding eggplant bacterial wilt disease

Knowledge scores of the respondent farmers ranged from 7 to 19 with a mean of 12.616 and standard deviation of 3.27. The distribution of respondent farmers according to their knowledge is shown in Table 4.1

Table 4.1 Distribution of the respondents according to obtained knowledge score

Categories	Scores	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low knowledge	Upto 8	8	13.3	12.616	3.27	7	19
Medium knowledge	9-16	45	75				
High knowledge	> 16	7	11.7				
Total		60	100				

Data presented in Table 4.1 reveal that half (75 %) of the respondents had medium knowledge while the rest half (13.3%) of them had low knowledge about bacterial wilt disease of eggplant. Farhad's (2003) study reveals that the majority (68%) the women farmers had medium

knowledge on pest management in vegetable cultivation compared to 17 percent had low knowledge and 15 percent had high knowledge while Ahmed et al (2009) found that majority (61.25%) of the respondents had medium knowledge followed by high (21.25%) and low (17.50%) knowledge on integrated farming.

4.1.2 Attitude of the respondents towards the bacterial wilt disease of eggplant

The attitude scores of the respondents ranged from 18 to 58 with a mean of 35.55 and standard deviation of 9.736. The distribution of farmers (respondents) according to their attitude is shown in Table 4.2.

Table 4.2 Distribution of respondents according to their Attitude towards the bacterial wilt disease of eggplant

Categories	Score (Years of schooling)	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Very less favorable attitude	Upto 12	0	0	35.5	9.7	18	58
Less favorable attitude	13-24	8	13.3				
Moderately favorable attitude	25-36	16	26.7				
Highly favorable attitude	37-48	27	45				
Very highly favorable attitude	49-60	9	15				
Total		60	100				

The data of Table 4.2 emphasize that Most (45%) of the farmers had highly favorable attitude followed by moderately favorable attitude (26.7%) with (15%) farmers had very highly favorable attitude and (13.3%) of the farmers had low favorable attitude towards bacterial wilt of eggplant. Which indicates most of the farmers keep positive attitude towards bacterial wilt of eggplant. (Table 4.2). The findings of Sadat (2002) and Ahmed et al (2009) had harmony with the present study. Sadat (2002) found that majority (72 percent) of the Proshika beneficiaries possessed a

highly favorable attitude towards Proshika, while 20 percent of them possessed a moderately favorable attitude and only few (8%) beneficiaries had unfavorable attitude towards Proshika while Ahmed et al (2009) found that majority (73.75%) of the respondents had highly favorable attitude followed by moderately favorable attitude (26.25%) towards integrated farming.

4.1.3 Practices of respondents towards the bacterial wilt disease of eggplant

The practice score of the respondents ranged from 11 to 33 with a mean of 21.42 and standard deviation of 6.39. The distribution of farmers (respondents) according to their attitude is shown in Table 4.3.

Table 4.3 Distribution of respondents according to their practices related to the bacterial wilt disease of eggplant

Category	Scores (Number)	Respondents(N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low	Upto 12	2	3.3	21.42	6.39	11	33
Medium	13-24	41	68.3				
High	>24	17	28.3				
Total		60	100				

The Majority (68.3%) of the farmers had medium practice followed by high (28.3%) practice. However, a few (3.3%) of the farmers had low practice on eggplant bacterial disease. The findings of the present study have harmony with the findings of Rahman (2001). He found that the three fourth (75percent) of the farmers fell under the medium adoption while 18 percent fell into high and 7 percent had low adoption of Aalok-6201 hybrid rice cultivation. Ahmed et al (2001) findings had disagreement with the findings of the present study. They found that majority of the respondents (52.5%) had low practice followed by medium practice (47.5%) of integrated farming.

4.2 Selected Characteristics of the respondents

Ten characteristics of the farmer were selected to find out their relationship with the eggplant cultivar. The characteristics were age, educational qualification, family size, experience in farming, experience in eggplant cultivation, occupation, , experience in farming, experience in

eggplant cultivation, farm size, annual income, occupation, organizational participation, extension media contact and training of eggplant cultivation. These characteristics of the farmer are described in this section.

4.2.1 Age

The age of the respondents ranged from 20 to 65 years, with a mean of 44.7 years and the standard deviation was 11.87. The distribution of the respondents according to their age is shown in Table 4.4.

Table 4.4 Distribution of respondents according to their age

Categories	Scores (Years)	Respondents(N=60)		Mean	SD	Min	Max
		Number	Percentage				
Young aged	Up to 35	17	28.3	44.7	11.87	20	65
Middle aged	36-50	23	38.3				
Old aged	>50	20	33.3				
Total		60	100				

Data presented in Table 4.4 indicate that majority (38.3 percent) of the respondents fall in the middle-aged category compared to young (28.3 percent) and old (33.3 percent). It was also found that middle-old aged respondents are more interested in eggplant farming. Biswas (2018) found similar result on age of the respondents. He found majority (57.83%) of the respondents were middle aged.

4.2.2 Level of Education

The level of education score of the farmer ranged from 0-15, with a mean of 7.25 and standard deviation 3.80. The distribution of the farmers according to their level of education is shown in Table 4.5.

Table 4.5 Distribution of farmers according to their education

Categories	Score (Years of schooling)	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Illiterate	0	5	8.3	7.25	3.80	0	15
Primary	1-5	21	35				
Secondary	6-10	24	40				
Higher secondary	11-12	7	11.7				
Honors	13-16	3	5				
Above	>16	0	0				
Total		60	100				

Data presented in Table 4.5 show that highest proportion (40 percent) of the respondents belonged to the secondary education category compared to one fifth (35 percent), one (11.7 percent), twentieth (8.2 percent) and one fortieth (5 percent) of the farmers belonged to primary, higher secondary and illiterate and above higher secondary of each other's level respectively. The findings also indicate that most of (40 percent) the respondents had secondary level of education. Aliyu (2014) found more or less similar result.

4.2.3 Family Size

The family size of the respondents ranged from 2-7, with a mean of 3.78 and standard deviation 0.9037. The characteristics of the respondents according to their family size category is shown in Table 4.6

Table 4.6 Distribution of respondents according to their family size

Category	Scores (Number)	Respondents(N=60)		Mean	SD	Min	Max
		Number	Percentage				
Small size family	1-4	49	81.7	3.783	0.9037	2	7
Medium size family	5-6	10	16.7				
Large size family	≥7	1	1.7				
Total		60	100				

Majority (81.7 percent) of the respondents belonged to the small aged family whereas 16.7 percent and 1.7 percent of them belonged to large and medium sized family respectively. The average family size (5.1) of the respondents of the study area is higher than the national average 4.5 people per household (BBS, 2019). It means that the people in the study area were less conscious about their family size and population growth.

4.2.4 Farming experience

The data of the table 4.7 express that farming experience score of the respondents ranged from 5-45 years with a mean of 24.1 and standard deviation of 11.905. The characteristics of the respondents according to their farming experience category is shown in Table 4.7

Table 4.7 Distribution of the respondents according to their farming experience

Categories	Scores	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low	10	12	20	24.1	11.905	4	45
Medium	11-20	19	31.7				
High	>20	29	48.3				
Total		60	100				

Data presented in Table 4.7 reveal that highest proportion (48.3 percent) of the respondents were high experienced compared to 31.7 and 20 percent had medium and low experience respectively. It means that most (80%) of the respondent had high to medium experience in farming. Aliyu's (2014) findings had harmony with the findings of present study. He found that the most (84.7%) of the farmers had medium to low experienced, followed by long (13.3%) experienced.

4.2.5 Experience in eggplant farming

The data of the Table 4.8 express that farming experience the score of the respondents ranged from 2-40 years with a mean of 12.366 and standard deviation of 10.848. The characteristics of the respondents according to their experience in eggplant farming category is shown in Table 4.8

Table 4.8 Distribution of the respondents according to their experience in eggplant farming

Categories	Scores	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low	10	41	68.3	12.366	10.848	2	40
Medium	11-20	10	16.7				
High	>20	9	15.0				
Total		60	100				

Data presented in Table 4.8 reveal that majority (68.3 percent) of the respondents were low experienced compared to medium (16.7%) and high (15.0%) experience.

4.2.6 Farm Size

The observed farm size scores of the farmers (respondents) varied from 0.03 hectare to .96 hectares. The average farm size was 0.3720 hectares and the standard deviation was 0.2246. The distribution of the farmers (respondents) according to their farm size is shown in Table 4.9.

Table 4.9 Distribution of respondents according to farm size

Categories	Score (ha)	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Landless	<0.02	0	0	0.3720	.2246	0.03	.96
Marginal	0.02-0.20	15	25				
Small	0.21-1.00	45	75				
Medium	1.01-3.00	0	0				
Large	>3.00	0	0				
Total		60	100				

The findings reveal that majority (75 percent) of the farmers possessed small sized farm compare to 25 percent of them having marginal. Badhe (2009) revealed that 39.17 percent of the brinjal growers were the holder of medium farm followed by 30.00, 17.50 and 13.33 per cent of them who had small, marginal and large size of land holding respectively. The average farm size

(0.794) of the respondents of the study area is higher than the national average less than 0.6 hectares (BBS, 2019).

4.2.7 Annual income

Annual income of the respondents ranged from 50000 to 500000 BDT with a mean of 127.16 and standard deviation 79.06 BDT. The distribution of the respondents according to their annual family income is shown in Table 4.10.

Table 4.10 Distribution of respondents according to annual income of their family

Categories	Scores (1000 BDT) (Tk)	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low income	Upto150	38	63.3	127.16	79.06	50000	500000
Medium income	150-300	20	33.3				
High income	>300	2	3.3				
Total		60	100				

Data presented in Table 4.10 reveal that half (63.3 percent) of the respondents had low income compared to medium (33.3 %) and high (3.3%) income. CIMMYT (1993) reported that wealthier farmers may be the first to try a new technology, especially if it involves purchased input. Many farmers who do not adopt may complain of a lack of cash or credit as the principal factor limiting their adoption. The average annual income (17783 Tk) of the respondents of the study area is higher than the national average (12549 Tk).

4.2.8 Organizational participation

The observed organizational participation score of the farmers ranged from 0 to 4 with a mean of 1.48 and standard deviation of 0.77002. The distribution of the respondents according to organizational participation score is presented in Table 4.12.

Table 4.11 Distribution of respondents according to their organizational participation

Categories	Scores	Respondents(N=60)		Mean	SD	Min	Max
		Number	Percentage				
No	0	2	3.33	1.48	.77002	0	4.00
Low	1 – 5	58	96.6				
Medium	6-10	0	0				
High	>10	0	0				
Total		60	100				

Data contained in Table 4.12 indicate that most (96.6 percent) of the respondents belonged to low organizational participation category while, a few (3.33 percent) of the respondents had no organizational participation. It also reveals that majority of the respondents are confined in their farming activities. Being busy with their farming activities it obviously that they don't have enough time to participate in different social organization.

4.2.9 Extension Media Contact

The observed extension contacts scores of the respondents ranged from 4 -11 having an average of 6.1 with a standard deviation of 1.59. The distribution of farmers (respondents) according to their extension contact is shown in Table 4.13.

Table 4.12 Distribution of respondents according to their extension media contact

Categories	Scores	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
Low extension contact	1-8	57	95	6.1	1.59	4	11
Medium extension contact	9-16	3	5				
High extension contact	17-24	0	0				
Very High extension contact	>24	0	0				
Total		60	100				

The findings show that 95 percent of the farmers had low extension media contact followed by medium (5%) extension media Contact. Thus, it can be concluded that all (100 %) of the respondents were getting help from the extension workers or to different extent (low to high). Hanjabam (2013) pointed out that the most of the farmers had medium level of extension agency contact (76.67 percent) followed by high level extension agency contact (15 percent).

4.2.10 Training

The observed training exposure score of the farmers ranged from 0 to 2 with mean of 0.4167 and standard deviation of 0.5906. The distribution of the respondents according to organizational participation score is presented in Table 4.14.

Table 4.13 Distribution of respondents according to Training

Categories	Scores	Respondents (N=60)		Mean	SD	Min	Max
		Number	Percentage				
No	0	38	63.3	.4167	.5906	0	2
Low	1	19	31.7				
Medium	2	3	5				
High	3	0	0				
Total		60	100				

Data contained in Table 4.14 indicate that highest proportion (63.3 percent) of the respondents belonged to no training exposure category followed by low (31.7%) and medium (5%) training above one tenth of the respondents had high training exposure.

4.4 Relationship between the Selected Characteristics of the Respondents and their K,A,P of the bacterial wilt disease of eggplant

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the farmers and their knowledge, attitude and practices (KAP) on bacterial wilt of eggplant. The selected characteristics of the farmers constituted independent variables and the KAP constituted the dependent variable of the study. In this section relationships between ten

selected characteristics (independent variables) of the respondents and dependent variable knowledge, attitude and practices have been described. Person's Product Moment Co-efficient of Correlation (r) was used. Five percent and one percent level of probability were used. The results of the coefficient of correlation (r) indicating relationship between the selected characteristics of the farmers and their knowledge, attitude and practices on bacterial wilt of eggplant are shown in Table 4.15.

Table 4.14 Relationship between the selected characteristics of the farmers and their knowledge, attitude and practices on bacterial wilt of eggplant:

Serial no	Selected characteristics	Knowledge	Attitude	Practices
1.	Age	-0.026	-0.108	0.014
2.	Education	-0.114	0.204	0.266*
3.	Experience in Farming	-0.085	0.291*	-0.145
4.	Experience of eggplant Farm	-0.102	-0.046	-0.017
5.	Family size (person number)	0.103	-0.140	0.001
6.	Farm size (hectare)	0.027	0.008	0.058
7.	Annual income	0.198	-0.061	-0.056
8.	organizational participation	0.027	0.185	0.151
9.	Extension media contact	0.149	-0.033	0.277*
10.	Training	0.321*	-0.191	0.003

NS= Non-significant **. Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

Among the 10 selected characteristics of the respondents family size, farm size, annual income, organizational participation, extension media contact showed a positive relationship with their knowledge about bacterial wilt disease of eggplant. Ahmed et al (2009) found that education, family income, organizational participation and extension contract showed a positive significant relationship with their knowledge in integrated farming. Experience in farming, experience in eggplant farming showed a negative relationship. This is probably because of that the experienced farmers are older in age and they are less involved in eggplant farming practices as a result majority of the farmers had less knowledge about bacterial wilt of eggplant. These consequences might influence to produce a negative relationship between the experience in farming and knowledge of the respondent about bacterial wilt of eggplant.

Among the 10 selected characteristics of the respondents experience in farming showed a significant relationship with their attitude regarding bacterial wilt of eggplant. It means that the higher is experience in farming more favorable is the attitude of the respondents regarding bacterial wilt of eggplant. The Education, organizational participation and farm size of the respondents showed a positive but non-significant relationship with the attitude in eggplant bacterial wilt of eggplant. Age, annual income and training showed a negative non-significant relationship. Shankaraiah and Swamy (2012) revealed that education, farm size, extension participation, mass media participation had positive and significant relationship with attitude of farmers.

Among the 10 selected characteristics of the respondent's education and extension media contact showed a positive significant relationship with their practice in bacterial wilt of eggplant. Ahmed et al (2009) found that farm size, annual income, organizational participation and extension contract showed a positive significant relationship with their practice in integrated farming. It means that the higher is the education and extension media contact the higher is the practice of the respondents in bacterial wilt of eggplant. The age, family size, farm size, training of the respondents showed a positive but non-significant relationship with their practice in eggplant farming.



Figure 3.2: Eggplant field of the study area

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

The main purpose of the study is to evaluate the knowledge, attitude and practice (KAP) of the farmers regarding bacterial wilt disease of eggplant. The study was conducted at Batiaghata upazila under Khulna district. The researcher deliberately selected five villages from the upazila. The selected villages of the Batiaghata upazila were Bosurabad, kismot fultola, Rangamari, Jhorvanga, Fultola. Data were collected from randomly selected 60 farmers of five selected villages of Batiaghata upazila under Khulna District through personal interview using an interview schedule during june 17 to 12 july, 2021. Data were collected on some selected characteristics of the farmers as well as knowledge, attitude and practice (KAP) regarding bacterial wilt of eggplant.

5.1 Summary of findings

5.1.1 Selected characteristics of the farmers

The major findings of the study are summarized below:

Age: Highest proportion (61.7%) of the respondent was middle aged as compared to 8.3 and 30 percent were young and old respectively were more interested in eggplant cultivation.

Educational qualification: Majority (46.7%) of the farmers had secondary level of education followed by primary (11.7%), illiterate (5%) and higher secondary (20%) level of education. Graduated farmers were (16.7%) found at the village. The farmers those who had secondary level of education are most interested about bacterial wilt of eggplant.

Family size (determines family type): Highest proportion (66.7 %) of the family belonged to the medium sized family while 30 percent and 3.3 percent of the farmers belonged to small sized and large sized family respectively.

Experience in farming: Majority (41.7%) of the farmers was low experienced in farming followed by medium experience (38.3%) and high experience (20%).

Experience in eggplant farming: Most (68.3%) of the farmers were low experienced in farming followed by medium experience (26.7%). The findings also indicate that almost all the farmers are low experienced (68.3%) and there is (5%) high experienced farmers.

Farm size: Majority (58.3%) of the farmers possessed small farm compared to 25 and 15 percent of them having medium and marginal farm respectively. None of the farmers belong to landless farm size category. Only a few (1.7%) of the farmers were large.

Annual family income: Most (50%) of the farmers were belonged to low income group, while only (41.7%) of the respondents belonged to medium income category. The findings also indicate that almost all the farmers are low income category (50%) and there is (8.3%) high income category.

Organizational participation: Majority (91.7%) of the farmers had low organizational participation. On the other hand, (8.3%) of the farmers had no organizational participation and no farmers having medium organizational participation and high organizational participation.

Extension contact: Majority (76.7%) of the farmers had medium scale extension media contact followed by low scale extension media contact (15%) and high scale extension contact (8.3%).

Training: Most (43.3%) of the farmers had received medium training on vegetable cultivation specially on eggplant cultivation. However, (28.3%) of the farmer had received low training on eggplant cultivation. About (16.7%) and (11.7%) of the farmer had no and high training experience on eggplant cultivation.

5.1.2 Focus KAP of the Respondent Farmers Regarding Eggplant Bacterial Wilt Disease

Knowledge on bacterial wilt of eggplant: Majority (50%) of the farmers had medium knowledge followed by high knowledge (50%) and no one had low knowledge on bacterial wilt of eggplant.

Attitude on bacterial wilt of eggplant: Most (71.7%) of the farmers had highly favorable attitude followed by medium favorable attitude (23.3%) and no farmers had low favorable attitude which indicates most of the farmers keep positive attitude towards bacterial wilt of eggplant.

5.1.3 Relationship between the selected characteristics of the farmers and focus variables (knowledge, attitude and practice)

Among the 10 selected characteristics of the respondents education, family size, farm size, annual income showed a positive relationship and training had significant relationship with their knowledge. While experience in Farming, experience of eggplant farming and organizational participation in eggplant farming had significant relationship with attitude. Only respondent's education and extension media contact showed a significant relationship with their practice in bacterial wilt of eggplant.

5.2 Conclusion

There is a consistency of knowledge and attitude of the respondents with their practice related to bacterial wilt disease of eggplant. Most of the farmers (75%) had medium knowledge and practice while most (71.7%) of them had highly to moderately favorable attitude towards management bacterial wilt disease of eggplant.

5.3 Recommendations for further research

This small piece of study being conducted in a specific location cannot provide all information for proper understanding about the knowledge, attitude and practice regarding bacterial wilt of eggplant in Bangladesh. Future studies should be undertaken covering more dimensions in the related matters.



CHAPTER 6

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APPENDIX A
AGROTECHNOLOGY DISCIPLINE
KHULNA UNIVERSITY

**KNOWLEDGE, ATTITUDE AND PRACTICES OF FARMERS REGARDING
EGGPLANT BACTERIAL WILT DISEASE**

Sample No......

Date.....

Name:**Union:****Block:**

Village:.....

Post:.....

1. Age **Years**

2. Educational qualification: Please put tick mark (✓) against the correct response

a) Can't read and write

b) Can sign only

c).....**Class/PSC/JSC/SSC/HSC/Bachelor/Masters Pass**

3. Family size

Sl. No.	Name of the family member	Relation	Age	Education	Profession
1.					
2.					
3.					
4.					

4. Experience in farming **Years**

5. Experience in eggplant farming **Years**

6. Annual family income

Source of income	Amount (BDT)
Agriculture	
Business	
Service	
Other (.....)	
Total	

07. Farm size:

Please furnish information about your lands according to use

Sl. No.	Use of land	Area of land	
		Local unit	Hectare
a	Homestead		
b	Own land under own cultivation		
C	Land taken from others on borga (1/2)		
D	Land given to others on borga (1/2)		
E	Land taken from others on lease		
F	Others		
Total	$a+b+\frac{1}{2}(c+d)+e+f$		

08. Organizational Participation:

Serial no	Name of the organization	No Involvement (0)	General Member (1)	Executive Member (2)	Executive officer (3)	Duration
1	Farmers club					

2.	NGO association					
3.	Mosque/ Mondir committee					
4.	Bazar committee					
5.	Youth organization					

09. Extension media contact:

Sl. no	Media	Extension contact				
		Never (0)	Seldom (1)	Sometimes (2)	Often (3)	Regularly (4)
I.	Peer group contact	Not even once in a month()	1-3 times/month ()	4-6 times/month ()	7-9 times/month ()	>9times/month ()
II.	Agricultural extension officers	Not even once in a month ()	1-2 times/month ()	3-4 times/month ()	5-6 times/month ()	6times/month ()
III.	NGO persons	Not even once in a month ()	1-2 times/month ()	3-4 times/month ()	5-6 times/month ()	6times/month ()
IV.	Input dealers(e.g. fertilizer dealers)	Not even once in a month ()	1-2 times/month ()	3-4 times/month ()	5-6 times/month ()	>6 times/month ()
V.	Radio/TV/Leaflets/Newspaper	Not even once in a month ()	1-2 times/week ()	3-4 times/week ()	4-5 times/week ()	>6 times/week ()

	per/ Mobile phone	week ()	()	()	()	month ()
VI.	Sub assistant Extension officers	Not even once in a month()	1-3 times/ month ()	4-6 times/month ()	7-9 times/month ()	>9times/ month ()
VII.	Field day	Not even once in a month()	1-3 times/ month ()	4-6 times/month ()	7-9 times/month ()	>9times/ month ()
VIII.	See agricultural poster, advertisement	Not even once in a month()	1-3 times/ month ()	4-6 times/month ()	7-9 times/month ()	>9times/ month ()

10) Training:

Have you received any training? Yes _____

No _____

If yes, please mention the name of the training with duration you have received from different organization

Sl. No.	Title of the training	Duration	Organization	Venue of training
1				
2				

11. Please specify pest and diseases observed in your eggplant field in the following years :

Statements-1	Farmers' perception		
	2020	2019	2018

1.Variety			
2.Potential area			
3.Actual area			

Statements-2	Farmers' perception			Statements-2	Farmers' perception		
	2020	2019	2018		2020	2019	2018
Disease/Pest Name				Disease/Pest Name			
1. Bacterial Wilt				5.Brinjal Shoot and Fruit Borer			
2. White Fly				6.Phomopsis Blight(Fruit Rot)			
3.Leaf Spot				7.Anthrnose			
4. Leaf Curl				8.Others			

12. Please specify the approaches you have followed for making eggplant free from bacterial wilt disease with their extent of adoption.

SL No.	Management practices	Degree of adoption			
		Frequently (3)	Occasionally (2)	Rarely (1)	Never (0)
A.	Pre sowing:				
1.	Soil treatment				

2.	Use of healthy seeds (Free from insects and disease)				
3.	Cultivation of resistant variety				
4.	Crop rotation				
5.	Maintains cropping season				
B.	Standing crop				
1.	Weed management (Prevention, Eradication and Control)				
2.	Maintains Proper sanitization during intercultural operation				
3.	Follows IPM techniques in eggplant field				
4.	Rouging of infected plant parts				
5.	Use of pheromone trap in the field				
6.	Use of pesticide				
7.	Perching in the field for insect control				
8.	Other indigenous methods (Spreading ashes/Spray of neem water etc.)				
C.	After harvest:				
1.	Harvest at mature stage				
2.	Burning of crop residue after harvesting				

13. Farmers knowledge and perception regarding eggplant bacterial wilt diseases:

Sl. No.	Question	Full marks	Marks Obtained
1	Which is the proper eggplant growing season?	2	

2	What is meant by eggplant bacterial wilt disease management?	2	
3	Name two bacterial diseases of eggplant?	2	
4	Cite the symptoms of eggplant bacterial wilt?	2	
5	How does pheromone trap helps to reduce bacterial wilt?	2	
6	Which vector is responsible for eggplant bacterial wilt disease spreading?	2	
7	Which is the soil treating procedure?	2	
8	Which are the consequences of use of high dose of pesticide to control bacterial wilt disease of eggplant?	2	
9	Which is the proper irrigation schedule for eggplant for controlling bacterial wilt?	2	
10	Which are the two common seed treating chemicals for making eggplant free from bacterial wilt?	2	
11	How does eggplant bacterial wilt disease disseminates?	2	
12	How crop rotations help to control bacterial wilt disease?	2	

14. Attitude towards Eggplant diseases:

Statements	Degree of agreement				
	Highly agree(5)	Agree(4)	Undecided(3)	Disagree(2)	Highly Disagree(1)
1. Eggplant are more vulnerable to diseases					
2. High humidity cause eggplant bacterial wilt					
3. Plant debris can cause eggplant bacterial wilt					
4. Flood irrigation in the infected field increases eggplant bacterial wilt					

5. Uprooting can control eggplant bacterial wilt					
6. Eggplant bacterial wilt can be identified early stage of the growth					
7. Cloudy Weather is responsible for eggplant bacterial wilt					
8. Eggplant bacterial wilt diseases are difficult to control					
9. Eggplant bacterial wilt diseases spreads easily					
10. Clean cultivation can control eggplant bacterial wilt					
11. Pesticides are used to control eggplant bacterial wilt					
12. Eggplant bacterial wilt is very destructive disease					



15. Practices on Eggplant diseases:

Sl. No.	Practices	Extent of practice			
		Regularly (3)	Sometimes (2)	Rarely(1)	Not at all (0)
1.	Use of disease free planting material				
2.	Use of resistant variety as an alternate to				