

Chapter I

Introduction

1.1 Background

From time immemorial agricultural crop suffered an enormous loss due to the attack of pest. It is vital to reduce the crop loss due to pest attack in order to boost the per unit crop production. According to an estimate, annual yield loss due to insect pest alone is 16 percent for rice, 11 percent for wheat, 20 percent for sugarcane, 25 percent for vegetables, 15 percent for jute and 25 percent for pulse crops in Bangladesh (MOA, 2004, 2008). The nature of pest infestation depends on many factors. Always a successful pest control needs a series of activities. A right track of monitoring, clean cultivation, soil type, past history, crop rotation, natural or climatic behaviour is the main consideration of that activities.

Bangladesh is a tropical country and it has a hot-humid temperature throughout the country. Maximum insects and diseases grew greatly by hot-humid temperature. For controlling insect pest a systematic surveillance method is necessary.

This surveillance method is not that much improve in Bangladesh so far. We have an annual pest prone chart according to respective pest's life cycle and damaging nature but did not have any geographical information regarding certain pest prone area. That is why the trend of specific pest attack in specific area is crying need in this purpose.

1.2 Problem of Rice Production in Bangladesh

Rice is the staple food in the everyday diet of Bangladeshis. The production of rice, which can be harvested 2 or even 3 times a year, reached 19.9 million metric tons in 1998-99 within the crop sub-sector food grains, particularly the rice crop dominates in respect of both area and production. At present, rice covers about 75 percent of the cultivated land in Bangladesh. The almost uneven topography and humid tropical climate of the country with abundant monsoon rain offers a unique environment for the rice plant in Bangladesh. As such, rice is the staple food of the people of this country and is part of their culture. Once this land was capable of meeting the food demand but with passage of time the cultivated land started diminishing with the rapid growth of population. Feeding of these new mouths with rice became a heavy burden with the present level of food production and thus there was a necessity for food imports. To minimize food import emphasis was given to the research and development of rice since the birth of Bangladesh.

In spite of doubling rice production in the country since the introduction of modern varieties in the early seventies, Bangladesh has experienced a continued annual shortage of nearly 1.5 million metric tons of food grains (Karim, 1999). This shortage of food production will continue to increase even if the present level of population growth is maintained. In other words, rice production has to be increased by at least 60 percent to maintain the present level of rice requirements by the year 2020 (Bhuiyan and Karim, 1999). Increasing rice production further is a gigantic task since there is no scope for horizontal expansion of the rice area due to the gradual diminishing of cultivated land as a result of diverting its uses for houses, roads, industries and urbanization. Therefore, options available for increasing rice

production are a) a breakthrough in the present yield potential of the varieties, b) full exploitation of the present yield potential of the existing modern varieties; and c) remove the constraint of insect pests and diseases with cost effective environment friendly way.

1.3 Rice Pest Status in Bangladesh

The intensified rice cropping of the green revolution boosted the year-round availability of resources for rice insect pests in Bangladesh. The profuse tillering ability of the semi-dwarf plant type markedly increased the available food supply and volume of suitable micro-habitats for pests. At the same time, a small number of high-yielding varieties replaced hundreds of traditional cultivars, dramatically reducing the rice genetic diversity with profound consequences for pest abundance. The new cropping system also increased the use of chemical fertilizers and pesticides, the latter affecting the natural balance between pests and their natural enemies. Excessive use of nitrogenous fertilizer enriches the plant nutrients, which then encourages the build-up of certain insect pests. The extension of irrigated rice cropping over more than 4 million hectares changed the typical characteristics of the dry season providing a humid microclimate suitable for many pests. Insects, pathogens and weeds still represent a major constraint to rice crop production in Bangladesh. A major thrust has been the promotion and implementation of integrated pest management (IPM) techniques as national policy.

1.4 Current Pest Management Practices

In Bangladesh, chemical control has been used as the primary method of pest control in the past. Up to 1974, the government promoted the use of pesticides by

supplying them free of cost to farmers (100 percent subsidy). The subsidy was reduced to 50 percent in 1974. The government withdrew subsidy completely in 1979 and the pesticide business was transferred to the private sector. However, to deal with emergency situations, the government should maintain a buffer stock of 15-20 metric tons of pesticides. After the withdrawal of subsidy, although the use of pesticides declined during 1979, their use has been on the increase again reaching 14,340 metric tons of formulated products or 2,462 metric tons of active ingredients in 1999 costing over one billion taka in foreign exchange (US\$ 18.5 million). Increased rice area, increase in cropping intensity and an increase in the area under high yielding varieties led to the increased consumption of chemical pesticides. (MOA, 2008). The appropriate surveillance and monitoring only can be fixed up the problem of excess use of chemical pesticide. The proper information of location specific rice insect pest infestation also would be helpful in decision making for rice farming in the specific growing season. For that purpose the study would be fix up two objectives. To develop spatially-explicit information on pest outbreak in Bangladesh rice production areas during the year 1999 to 2008 and to compare the surveillance method operating by different types of farmers in the study area.