

CHAPTER I

INTRODUCTION

Myanmar is an agricultural-based country situated in the South-East Asia, it borders on Bangladesh, India, China, the Lao People's Democratic Republic and Thailand. The country has a total land area of 676, 577 Sq km and also has a long coastal line of 2,276 km. The country is surrounded by mountains in the north, west and east. Myanmar is in AEZ (Agro-eco-zone) which characterized as warm sub humid tropics. It receives its annual rain mainly from South- West monsoon from mid May to mid October. The precipitation varies depending on the locality, elevation and months.

Myanmar possesses plentiful natural resources of land, water, fauna, flora and a favorable climate which forms the basis for the development of agriculture sector. The total cultivated area under various crop cultivars is about 167 million acres (17.4 per cent of the total area) (MOAI, 2010). Most of vegetables are grown in the central part of Myanmar, mainly Dry Zone areas and Shan State. Mandalay, Sagaing and Magway divisions are major production areas for onion, chili and tomato. Shan State produces rainy season tomato, potato and cool-season crops. For the vegetables production; onion, chili, potato, garlic and cool-season crops are considered as priority crops (Naing, 2010). Total vegetables growing area in Myanmar is 407 million hectare and total production is 4,357 million metric ton (MOAI, 2009).

Different kinds of vegetables are grown in the diversified agro climatic zones of Myanmar (MOAI, 2010). Table 1.1 shows the production of vegetables in Myanmar. Vegetables are a major component in daily diet of Burmese. The various kinds of vegetables crops grown for the domestic market in backyard gardens, commercial plots and fields are subject to a range of insect pests and diseases problems (Ingram *et al.*, 1973). Farmers commonly use pesticides for controlling insect pests because chemicals have an immediate knock-down effect and are easily available in the local market.

Spraying of inappropriate chemicals, excessive application, inappropriate timing, the wrong combination of chemicals, and spurious chemicals lead to insecticide resistance which causes farmers to spray even more pesticides.

The large amount of vegetables is produced in Pyin Oo Lwin. Having the limited size of the plots vegetable growers are using large amount of pesticides in the expectation of high yield. In addition people lack of knowledge about pesticides, and many of those who do know about it continue to indulge in unsafe applying and doing practices (Wai, 2005). Nowadays, chemical control could be the most efficient and easiest way to combat insect pests of vegetables and flowers. Insecticides are quick in action and thus more convincing to the farmers. Farmers were not particular about the real dose of insecticides and their application. Sometimes they use insecticides on non target organisms, destroying natural equilibrium position. Judicious use of pesticides in pest management program is still not practiced by the farmers due to their illiteracy, socio-economic problems and lack of organizational cooperation between relevant agencies (Thu, 2004).

Table 1.1 Production of vegetables in Myanmar (2008-2009)

No	Name of vegetables	Sown area ('000 ha)	Production ('000MT)
1	Tomato	110,277	1290,858
2	Mustard	34,031	238,312
3	Cabbage	28,219	449,250
4	Carrots	2,490	25,452
5	Bottle gourd	19,715	218,614
6	Water melon	17,186	228,936
7	Lettuce	8,481	56,765
8	Cauliflower	24,303	314,619
9	Radish	21,083	271,988
10	Asparagus	349	1,410
11	Other vegetables	241,618	2260,923

Source: Ministry of Agriculture and Irrigation, Settlement and Land Records

Department (2010)

Farmers are increasing their efforts to make a living on crops other than the traditional crop like vegetables. One alternative crop that can return a large profit on a small tract of land is fresh cut flowers. People used cut flowers especially chrysanthemum, ester, gladiolus and rose for so many purposes in our country. The high value of specialty cut flowers can increase farm income. Therefore, almost all of the flower growers have been using pesticides to protect the yield lost and to get good quality products in this study area. But the pesticides use on flowers is not without danger to the plant itself, insects and animals that pollinate it or eat it and even

humans who enjoy them as cut flowers in their homes. Phytotoxicity can develop with pesticide use, pollination can decline and humans can be harmed physically.

Awareness on harmful effects of pesticides of the people is one of the fields of studies which are still weak in research. Only a few number of research related with awareness on pesticides of the farmers have been conducted in our country.

Some farmers, especially in developing countries, are not well educated and have poor exposure to information access concerned with awareness of harmful effects. They are still using the synthetic agro-chemicals unconsciously with insecure techniques and inappropriate dosage. It is threatening the sustainable use of natural resources in our environment. Therefore, the awareness of the farmers plays a very important role in the systematic use of natural resources and the environment quality can be maintained by the adoption of sustainable agricultural practices by the farmers. No matter how the scientists try to work on a lot of researches for environment and natural resource management, the attitudes / awareness and behaviors of the farmers are the most important as they are direct resource user and their actions directly affects the environment. Therefore, it is very important to upgrade the awareness of the farmers and the government should take a serious consideration for this issue as a political context (Lwin, 2005).

Farmers also use mixtures of pesticide; although the dosage may be sub-lethal initially, mixing several chemicals may double the concentration of noxious components. Even if the extension service organizes tomato farmers to use a new and safer pesticide, only a few innovative farmers adopt it in the main producing areas. Due to the sharp rise in price, some farmers do not follow good agriculture practice (GAP) and sell their tomatoes immediately after pesticides application (Myint, 2005).

It is thought that, with increasing pesticides use in regions with intensive agriculture, adverse effects will inevitably arise, as producers who are unaware of the negative effects of pesticides on human and environmental health may use excessive amounts and incorrectly. In contrast farmers aware of the harmful effects of pesticides are expected to behave differently with better selection of pesticides, amounts used and application practices. However, for various reasons, producers are sometimes unable to translate their level of awareness on this subject into their practices, that is, they may not behave consistently (Isin and Yildirim, 2006). Awareness of the people is also one of the fields of studies which are still weak in research. Only a few numbers of researchers have been conducted to measure or evaluate the awareness of the farmers and their attitudes on environment (Lwin, 2005).

Even though tomato farmers are aware that monocrotophos is a banned pesticide, it continues to be used by about 50 per cent of farmers interviewed. The reason is that it is cheaper compared with legal pesticides (Myint, 2005). Tomato farmers do not observe the economic threshold level and prefer more frequent application as they are afraid of crop loss and reduction in yield. In Inle region about 83 per cent of farmers in the sample sprayed pesticide whether pests attack or not. In addition, farmers are not aware of the minimum time difference between the final spraying of pesticide and harvesting. About 63 per cent of farmers interviewed admitted to selling tomatoes immediately after pesticide treatment due to a sharp rise in price and strong demand of local wholesalers (Myint, 2005).

Being a developing agricultural country, at least for the foreseeable future, Myanmar will inevitably use pesticides in agricultural food production, although other parallel efforts of a non-chemical nature are being investigated in plant protection

strategies. The most practical way to handle the pest problem is the use of chemicals with intelligent concern and proper control.

The quantity of pesticides imported by semi-government organizations and NGOs has been growing in recent years. In the near future the proportion of imports by private organizations may dominate as a result of government policy to encourage the private sector while the government concentrates on technical and legislative measures.

The Ministry of Agriculture has a pilot pesticides formulation plant for which technical grade materials are imported and pesticides produced. The plant extract insecticide is produced by the ministry's pilot neem pesticide plant. Insecticide from the neem tree is effective against many leaf-eating caterpillars but has little or no toxic affect on humans or the environment.

For the purpose of scrutinizing the efficacy of pesticides to be approved for use, minimizing hazards to human health and environment, promoting safe and effective use of pesticides, and assurance of registration, the government formed the Pesticide Registration Board in 1992 and entrusted to implement the Pesticide Law with the following objectives.

- (a) The registration of all pesticides before marketing;
- (b) The control of pesticide use on food and the environment;
- (c) The control of pesticide production, distribution and disposal etc.;
- (d) Monitoring the quality of pesticides in use;
- (e) The control of residues in food and the environment.

So far, no national standards for pesticide residues have been established. Since Myanmar has encountered some pesticide residues in food from international trade, it is essential to set maximum residue limits and legally control them.

Although there are reminders from officials of the Ministry of Agriculture to be careful when using agricultural chemical pesticides, at present, many farmers at different places said that they still cannot give up. Farmers in Pyin Oo Lwin said that the use of agricultural chemical pesticides is still a crucial method that cannot give up so that their crops provide good yields to meet the markets and their needs. U Mg Mg, 58 years, a grower in Pyin Oo Lwin said that so far, he still uses agricultural chemical pesticides, although he knows that they can affect his health and that of the consumers, because there is no choice.

The consumption of unsafe food can damage public health, which can increase the cost of medical care. Thus, the government has a crucial role in ensuring that food does not endanger consumer health through chemical, biological and other contaminants. In order to have safe fresh produce, a variety of measures such as laws, regulations and standards, and a system of effective inspection and laboratory analysis are still needed in Myanmar (Myint, 2005).

Increased agricultural productivity may require application of pesticides to combat pests and diseases, but their use must be controlled and users aware of possible undesirable effects on human health and the natural environment. Incorrect use of pesticides on the one hand reduces agricultural sustainability by causing environmental problems such as underground and surface water pollution, destruction of beneficial organisms and acquirement of resistance by pests, and on the other hand can have harmful effects on the health of both farmers and consumers. There are few

studies conducted to measure or evaluate the awareness of the farmers and their behavioral practices on using pesticides. Pesticides cannot be abandoned for agricultural crops production but we should strong emphasis on the less and safe use of pesticides. Therefore, this study was conducted with following objectives;

1. To identify the existing practices of pesticides application on vegetable and flower growers in Pyin Oo Lwin township
2. To determine the factors influencing the awareness on harmful effects of pesticides
3. To identify the relationship between vegetable and flower growers awareness on harmful effects of pesticides and their practices