

CHAPTER I

INTRODUCTION

1.1 Statement and significance of the problem

Over past several years, chemical pesticides have been imported to purchase in Thailand. Increasing pesticide requirement is due to rising of agricultural production; changing of cropping system from mixed crop to monocrop causes more problems on diseases and insect pests. When breaking out of diseases and pests, easy and quick way to do is using chemical pesticides. The farmers want to protect their crops to have high quality and quantity as much as possible.^{(1), (2)}

At present, the Royal Project Foundation has exported agricultural produces, especially sweet pepper which is one of economic crops that has high value and brings good income to the country. But the problem often occur when EU customer rejected the exported produces from Thailand because of pesticide residues were found at higher concentration than EU MRL level. Chemical insecticides are commonly used by the farmers to protect their cultivated crops. Although the produces normally be screen checked by GT Pesticide Test Kit (developed by Ministry of Public Health Thailand) followed by analysis with standard method, the pesticide residue still be found. This due to the MRL level set by EU lower than FAO/Codex MRL. There is a limitation on GT-Test Kit because it can be used for pesticide screening and specific for only 2 groups; organophosphate and carbamate. Standard method must be used to analyze the insecticide. But some insecticides cannot be analyze by general method and in most cases very expensive tool is needed for analysis. Fipronil is the one that must use LC-MS for analysis. With GC-MS available in our laboratory, it is necessarily to find the way to analyze this insecticide.

CODEX is an international food organization. It is a joint program between FAO (Food and Agricultural Organization) and WHO (World Health Organization). This program works for the risk assessment and the maximum amount of residue allowed to be in the fresh crop yield and agricultural products known as Codex-MRLs (Maximum Residue Limits) which is recommend by the United Nation. For fipronil in

vegetables, the Codex MRL is at 0.02 milligram/kilogram while the EU-MRL of fipronil in sweet pepper is at 0.005 milligram/kilogram which is very low, even lower than chlorpyrifos (2 milligram/kilogram) and imidacloprid (1 milligram/kilogram)^{(3),(4)}. Since fipronil is an effective insecticides and it is well accepted by the farmer, it is important to know how to analyze it so that the good results came out can be extended to the farmers and sweet pepper produces can be properly checked before exporting.

1.2 Purposes of the research

To improve the analytical method and to check the quantity of fipronil residues in sweet peppers with the technique of GC (gas chromatography) connecting with the MS (Mass Spectrometry).

1.3 Scope of Research.

The method for extraction of fipronil and appropriate conditions for analysis of the fortified samples were tested. In this study the sweet pepper samples were prepared by cultivating the plants in the plot. When the plants set fruits and reached maturity, they were sprayed with fipronil at 2 concentration rates for 1, 2, and 3 times. The fruits were randomly collected to be analyze for fipronil residue and its derivatives.

1.4 Education and application advantage.

To learn techniques of extraction, how to grow sweet pepper plants, how to spray the insecticide and how to analyze fipronil and its derivatives. Research results can be used for guiding the farmers how to use fipronil correctly and harvested at safety dates after spraying.