

CHAPTER 1

INTRODUCTION

At present, with rapid increase of population, nutrient requirements of people, especially requirement of protein, have become an imperative problem in socio-economic development of many developing countries over the world. In these countries, protein source is supplied mainly from crops. According to Wijeratne and Nelson (1987), approximately 90 percent of the calories and over 80 percent of the protein in the diets of many Asian countries are derived from plant sources. And in this situation, food legumes occupy a premier position among crops in supplying protein and vegetable oil for human nutrition.

Apart from this, food legumes are considered an important component in farming systems in terms of ecology. They are capable of utilizing atmospheric nitrogen through biological nitrogen fixation and therefore they are much less dependent on synthetic nitrogen fertilizers than non-legume crops. In addition, since introduction of food legumes in to crop rotations often breaks the buildup of pests and diseases in cereals, food legumes have become the favorite crops for crop rotation in many countries in the world (McWilliam and Dillon, 1987).

In Vietnam, with a population of about 70 million people, food legume crops play a very important role both in the nutrition of people and animals and as an ecological sound component of farming systems of the country, especially in Northern mountainous region

where there are many problems of human malnutrition and soil fertility degradation (Dau, *et al.*, 1991).

The mountainous region of Northern Vietnam consists of 12 provinces with an area of 93, 498 sq km, occupying 28.2 per cent of total land area of the country, and with total population of 7.3 million people, accounting for 10.4 per cent of total population of the country (General statistical office, 1992). Thus, it is clear that this is region with lower population density and higher land area per capita than other region in the country. However, with more than 90 percent of land area of sloping land with serious erosion during rainy season, leading to decrease of soil fertility. Furthermore the population is made up of 43 ethnic minority groups, whose living standard is still quite low (Dau *et al.*, 1991, Sam, 1994).

RATIONALE

Now there are two main problems facing agriculture in the mountainou regions of Vietnam (i) to maintain and improve soil fertility and (ii) to increase nutritional quality in human diets. In order to contribute to improving human nutrition and animal feed as well as soil fertility, developing food legume production offers a promising solution (Dau *et al.*, 1991).

In the Northern mountainous region, food legumes are considered as minor crops in terms of sown area, productivity and inputs for production, despite their role as an important source of protein and oil in the diets of people and animal feeds as well as a

major source of biological nitrogen in cropping systems of the region, contributing to soil conservation and development of a sustainably agriculture.

According to General Statistical Office of Vietnam in 1992-1993, sown area of food legumes occupies only 6 percent of the total sown area of cereals (3.6 percent for oil-seed legumes and 2.4 percent for pulses). Low productivity is one of the main reasons limiting food legume production in the region. Adverse soil condition is major cause of low productivity of food legumes in the region. In general, soil in the mountainous region of Northern Vietnam has low fertility, low pH, high exchangeable aluminum content, severe phosphorus deficiency (Siem and Phien, 1992; Dau *et al.*, 1991). With such soil conditions, growth and development of food legumes are restricted considerably, possibly with limited nitrogen fixation leading to low productivity. Thereby, I suppose that estimating correctly the role of food legumes in farming systems and finding out measures for improving their productivity in the region is very necessary.

In order to contribute to the solution to this problem, I have carried out a study in Northeast mountainous region of Vietnam with following objectives:

1. To evaluate the role of food legumes in farming systems in Northern mountainous region of Vietnam.
2. To examine responses to possible soil improving measures in soybean and peanut.