INTRODUCTION

Leguminous plants are characterized by a high protein content in the seeds, therefore, they are of remarkable nutritional and agricultural interest. The major seed storage protein fractions of most leguminous plants have been already identified and fractionated by many authors **(Derbyshire *et al*., 1976; Khan *et al.*, 1980; Brown *et al*., 1981a and b; Matta *et al.*, 1981a&b and Nielsen, 1985).**

French bean (*Phaseolus vulgaris* L.) is an important leguminous crop in many parts of the world. Being a desirable foodstuff, it has been cultivating since ancient times. In general, the nutritional value of legume seed storage proteins is limited by their storage in sulfur-containing amino acids **(Derbyshire *et al*., 1976; Polignano and Lioi, 1985 and Hoffman *et al*., 1988).**

Soybean (*Glycine max* L.) is one of the important crops and one of the world's major sources of vegetable oil and protein (Soybean seeds contain about 20% oil and 40% protein on a dry weight basis). Moreover, soybean is considered as one of the important forage crops. It is consumed in numerable ways, seeds may be eaten green before maturity, and whole mature seeds are eaten, sprouted to flour, or processed to soymilk. The seeds also may be fermented to produce a high protein product or dark sauces widely used in cooking. Soybean oil is edible, but also, has many

industrial uses. In addition soybean meal after oil extraction is used as high protein animal feed.

The high protein content in soybean and french bean suggests they as a good source for protein in overcoming lack of meat in developing countries. So in Egypt a great attention has been recently paid to increase the cultivated areas of both crops. Increasing area covers the deficiency of human and animal protein and solves the problem of food security, as well as increase the edible oil production.

The french bean and soybean plants are subjected to many diseases during the growing season, which cause great loss in yield and seed oil contents. The root and hypocotyl rots are of the severe and widespread diseases of beans and soybean in A.R.E. as in many other countries. This disease is caused by the soil-borne pathogenic fungus *Fusarium solani* f.sp. *phaseoli* and *Fusarium solani* f.sp. *glycine* as well as by the anthracnose fungus *Colletotrichum lindemuthianum*.

The resistance to this disease, its chemical, physical and biological control have been the subject of many research work. However, recently the reactions between the pathogen and the host at the cellular, biochemical and molecular levels are emphasized.

The main goal of the work described in this study was to investigate the prime mechanism(s) of induced resistance of french bean and soybean against *F. solani* f.sp. *phaseoli*, *F. solani* f.sp. *glycine* and *Colletotrichum lindemuthianum* under laboratory

conditions. Morphological, histological, biochemical and molecular studies were carried out to investigate host susceptibility and resistance and in addition to investigate the effect of incubation temperature in different reactions with plant (s)-fungal pathogen(s) combination systems selected for this work.