INTRODUCTION

Wheat is considered to be the most important cereal crop in the world and the first strategic food crop for more than 7000 years in Egypt. It has maintained its position during that time as the basic staple food in Urban areas and mixed with maize in rural areas for bread making. In general, over 30 percent of the caloric intake is from wheat flour products, primarily bread. The government of Egypt has subsidized bread consumption for decades as a way to raise nutritional levels and to benifit low-income families. In addition, wheat straw is an important fodder for animals.

In Egypt, the average cultivated area at the last ten years (1990's) ranged between 2.512 and 2.605 million feddans, which produce about 6.118 million tons yearly. In 2004 / 05 growing season, about 3 million feddans were cultivated by wheat and yielded about 8.185 million tons with an average of 18.16 ardab/ feddans*. In the season 2005 / 2006 the cultivated area was increased up to 3.275 million feddans as an attempt to satisfy the shortage in grain requirements.Wheat is liable to attack by many diseases i.e. rusts, loose smut, downey mildew, wilt and root rot diseases.Wilt and root rot diseases are considered one of the common diseases in Egypt and the world.

Root diseases favoured by wet soils are caused by *Gaeumannomyces graminis* which is a major root pathogen of wheat world wide.In the dry land wheat production areas of North America wheat root diseases are mainly caused by *Cochliobolus sativus* and *Fusarium* species. *Fusarium* species causes vascular wilts of many plants, the symptoms of wilt include drooping of leaves and stems, chlorosis, stunting, discoloration of the vascular tissue, and eventually death of the entire plant.Root and crown rot is most severe when wheat are planted continuously without rotation to other crops.Under these conditions,the root rot fungi can build up to very high levels in the soil. The symptoms of common root rot in wheat include dark brown lesions which appear on the outer coleoptile tissue and / or on the leaf base. Lesions may coalesce into long areas of nectrotic brown tissue. In extreme cases, the entire seedling may die. In some cases, necrosis may extend upward into the plant crown, encompassing the base of the leaves and tillers and may result in plant death prior to heading.Root rot if does not kill,it weakens the plant so that it produces fewer tillers and fewer heads, and there is less grain in each head. Grain from root-rotted plants may be shriveled or have a low test weight.Crops which do not show killed individual plants may still be suffering a reduced yield from root rot.

Control of these pathogens depends mainly on fungicides. Chemical fungicides pollute the environment and disturb the ecological balances for all living microorganisms and cause harmful effect for beneficial

microorganisms.Biological control is becoming an important component of plant disease management and offers solvations to many of the persistent problems in agriculture.The development of biological products based on beneficial micro-organisms can extend the range of options for maintaining the health and yield of crops. In the mid-1990s in the USA, *Bacillus subtilis* started to be used as a seed dressing,with registrations in more than seven crops and application to more than 2 million hectare. The genera *Pseudomonas*, *Arthrobacter*, *Clostridium*, *Achromobacter*; *Micrococcus*, *Flavobacterium* and *Bacillus* species are the most common types of bacteria isolated from soil samples .Many reports of rhizosphere colonization and root disease control with *Bacillus* spp. introduced as seed inoculants.

In recent years plant pathologists and commercial companies have shown considerable interest in the application of biological control agents. Biological control of soil-borne plant pathogens by antagonistic fungi is likely to be the best alternative to conventional chemical control methods. The potential of *Trichoderma* spp. and *Gliocladium* spp., as a bio-control agents for several soil borne pathogens had been proved by many investigators.*Trichoderma* spp. have received particular attention as agents for the biological control of fungal pathogens of plants and appear to be likely candidates for successful exploitation in the future.Despite extensive research over the last 50 years on the capability of *Trichoderma* spp. to reduce the incidence of disease caused by soil-borne plant pathogens. The mechanisms to be involved in bio-control by these fungi are antibiosis, lysis, competition, mycoparasitism and promotion of plant growth. It seems reasonable to assume that successful antagonism may rely on a combination of these modes of action.

Immunological techniques for the detection and identification of particular micro-organisms are of great value because of the specificity of the reaction between antigens of the organisms and the corresponding antibodies, which are produced in the serum of the animals inoculated with the organism. Serological techniques originated in human biology, where they were initiated used in clinical microbiology. Detection and diagnosis of fungi have been studied intensively since 1980's, which used for differentiating between formae or races of fungi , and interaction between pathogens and plants to detect resistance or susceptibility to these pathogens.

The aim of the present work was undertaken to find out:

1-Isolation and identification of the causal organisms of wheat wilt and root -rot diseases at different governorates in Delta Egypt.

2-Frequencies of the identified pathogens.

3-Detecting the resistance of some bread wheat cultivars to wilt and root-rot diseases.

4-Biological control studies against the most frequent pathogen using different forms of microorganisms.

5-Serological studies using two methods for detecting the antigenic relation-ship between bio-control agents and the most frequent pathogen.