INTRODUCTION

Wheat is considered to be the most dynamic sector in world grain production. In Egypt, the average of wheat area harvested during (1997/1998) was 2.421 million feddan, yielding 6.1* million tons while the net imports of wheat during the same period is estimated by about 5.6 million tons **(Anonymous, 1998)**.

During the last decade (since 1988) wheat cultivation in Egypt was triggered. Area under wheat increased from 592,000 to 1,017,000 hectare. Productivity increased from 4.75 to 5.99 t/ha and self reliance increased up to 5-60%. Although Middle Egypt enjoys the optimum environmental condition for growing wheat, e.g. high soil fertility in most areas as well as moderate climatic conditions it suffers from some biotic stresses, i.e. leaf rust and aphids and abiotic stresses, namely low fertility, drought and salinity in the new lands. Meantime, the major problems facing wheat in Delta are rust and smut diseases and soil and water salinity beside possible drought conditions by the end of water canals. The increments in the old and new land wheat production led to the decrease in Egypt wheat imports from 5.6 to 4.3 million ton and an increase in the percentage of Egypt wheat production self reliance from 43 to 57% **(Anonymous, 1998)**.

Under the Egyptian environmental conditions, wheat (*Triticum astivum* L.) is subjected to the attack of rust diseases i.e. stem, leaf and stripe rusts incited by *Puccinia gramins tritiici*, *P.*

*Statistical Report, Ministry of Agriculture, 1998

recondita and *P. striiformis*, respectively. Also, the wheat rust diseases are the most common diseases in Egypt. Many varieties were canceled for their susceptibility to these diseases (**Abd El-Hak** and **Kamel, 1973** and **Abd El-Hak *et al.*, 1983**).

The significance of each disease in particular depends upon the prevalence of the aggressive and/or virulent forms of the parasite and their affinity or compatibility with the genetic constitutions of the host under a given environment. Therefore, the cultivated wheat varieties suffered from sudden epidemics during the five elapsed decades from the perspective of change in weather conditions in relation to the genetic make up of both host and parasite. The first leaf rust epidemic in Egypt was recorded with wheat var. Giza 139 during 1945 and the second was recorded during 1968 when the stripe rust destroyed most of the wheat area grown to the var. Giza 144 in Northern governorates in general and Manzala district in particular (**Abd El-Hak and Kamel, 1973**).

The high susceptibility of the Mexican varieties viz: Mexipak 69, Super X and Chenab 70 to leaf rust is considered the third disaster in Egypt during 1978 and the estimated losses ranged from 20 to 25% (**Saari** and **Prescott, 1985**).

The last dramatic epidemic was that of 1995 in which stripe rust attacked most of the commercial wheat varieties causing sever infection particularly in North and South Delta districts the yield of wheat cvs. Gemmiza 1, Giza 163, Sakha 69, Giza 157,

Sakha 92, Giza 166 and Giza 164 was significantly affected by the disease attack **(El-Daowdi *et al.*, 1996)**.

The main objectives of this work were:

- To screen for new sources of resistance to leaf and, stripe rusts.
- To study the behavior of certain wheat cvs. and/or high yielding lines under epidemic circumstances of stripe rust.
- To assess the grain yield loss as affected by leaf and stripe rusts on the certain cvs.
- Furthermore, it is also an attempt to evaluate certain new systemic fungicides for controlling leaf and stripe rusts diseases of wheat.
- To postulate resistance genes in wheat entries acting against leaf rust through the matching between them and certain Lr's under the stress of seedling inoculation with isolates of *Puccinia recondita*.