# SUMMARY

Studies on the sensitivity of certain wheat entries against leaf and stripe rust in Egypt whet (*Triticum aestivum* L.) is liable to the attack of many diseases in Egypt i.e. rusts, smuts, powdery mildew and some other diseases of minor importance. Rusts induce high losses to wheat in Egypt. The difficulty of controlling rusts are due to it's obligatory habit and to its dynamic nature.

The present study focused a spot light on certain topics relevant to the application of genetic control of both leaf and stripe rusts through out the identification of the predominant races of leaf rust and the isolates of stripe rust. The study also involved the distinction of certain effective genes of leaf rust via the inoculation of 18 leaf rust monogenic lines. The ultimate goal of such a study is to contribute the breeding programme in the scope of rust resistance.

The study included the testing of 36 wheat entries against the more prevalent and virulent races of *P. recondita* (leaf rust) and also against 3 isolates of stripe rust (*P. striiformis*) at seedling stage. On the other hand the same entries were subjected to the evaluation against the two concerned diseases at adult stage.

The study also included the effect of different temperatures on the incubation periods for wheat entries. The evaluating of systemic fungicides and 2 bioagents against leaf and stripe rusts was carried out during the study.

The effect of stripe rust (*P. striiformis*) on the chemical constitutions of wheat kernels was also studied.

The results of the present work could be summarized in the following items:

1- Seven physiologic races of leaf rust (*Puccinia recondita*) were identified during 1996/1997 and 1997/1998 growing seasons. Race no 77 was the most predominant one followed by races no's 57, 20, 21, 130 and 184.

2- The study gave evidence to the distinction of Lr's 19 and 24 in controlling leaf rust uredospore populations throughout two seasons.

3- Ten and six wheat entries proved to the resistant to leaf rust races viz. 77 and 57 in respect likewise 9, 13, 13 entries were resistant to the 3 isolates of stripe rust (*P. striiformis*) at seedling stage during 1996/1997.

4- The matching between leaf rust monogenic lines and certain wheats, when inoculated with 34 single pustules of *Puccinia recondita* resulted in the postulation of genes i.e. 29, 39, 3 ka, 16, 18 and 24 in most of the tested entries as common genes.

5- The incubation periods were prolonged with the decreasing temperature and the reverse was true with the test cultivars when inoculated with races 77 and 57 at seedling stage.

6- The field evaluation gave evidence to the superiority of entries i.e. Sakha 61, Giza 144, Giza 155, Tosson and Sakha 24 when subjected to severe inoculation with stripe rust during two seasons. The rest of tested entries exhibited a reaction ranged between "trace S and 80 S". The wheat entry i.e. Sakha 24 was characterized by the lowest Area Under Disease Progressive Curve (AUDPC), however the reverse was observed with Sids 7 and -9. On the other hand, the entries showed significant differences in stripe rust rate of increase and certain yield parameters i.e. 1000 K.W. and test weight. The highest loss (%) was recorded with cvs. Sids 5 and -9, conversely, Sakha 10 exhibited the least rate in this regard.

7- As regard to leaf rust evaluation, the study gave evidence to the distinction of entries i.e. Lines 202, -204, -206 which rated (TrS). The rest of materials rated 5S to 80S. cv. i.e. Tosson exhibited the lowest (AUDPC) however the reverse was noticed with cvs. i.e. Sids-1, Giza 139. Some entries showed significant differences disease rate of, test weight and 1000 K.W.

8- The study gave evidence to the increasing efficiency of fungicides i.e. Fangshow, Sumi-8, Caramba, Punch and Impact in respect when tested against both of stripe and leaf rusts. On the other hand, Plantvax, Plantguard and trilogy occupied the second rank in this respect.

9- The study gave evidence to the increase of both peroxidase and polyphenol oxidase in resistant entries comparable to the susceptible ones. On the other hand, irrespective of the presence of significance between entries in the increasing activity of polyphenol oxidase, but its activity was rare. This may be due to that cereals did not contain polyphenol oxidase and its activity was related to host pathogen interaction.

10-Anatomical characters were not conspicuous or clear cut to differentiate between resistant, moderate resistant and susceptible entries the ratio of collenchyma/sclerenchyma may be considered a clear measurement between entries.

11-Concerning the effect of stripe rust infection on chemical constitution of wheat kernels in tested vars. the study gave evidence to the presence of higher humidity, lipids, carbohydrate contents in the protected grains. However, the stripe rust inoculated ones exhibited higher contents in ash, fibers and protein.