SUMMARY

Barley is vulnerable to attack by a relatively large number of foliar diseases. The present investigation was carried out to survey barley foliar diseases in Egypt with special reference to leaf stripe caused by Helminthosporium gramineum . Results may be summarized as follows:

(1) Barley foliage is attacked by eleven pathogens that cause the following diseases in Egypt, i.e., leaf stripe, net blotch, spot blotch, powdery mildew, downy mildew, leaf rust, stem rust, stripe rust , minor leaf spots, barley stripe mosaic virus and barley yellow dwarf virus.

(2) Barley leaf stripe causes damage of leaves and may prevent the emergence of heads from the leaf sheath. Stripe appears heavily in the humid districts. Its prevalence is more in Delta Region than in Southern Region of Egypt.

(3) Twelve isolates of H. gramineum were isolated from striped samples. Conidiophores were dark brown, straight and ranged from 100 to 300 U, whereas conidia were sub-hyaline to yellowish brown straight, sub-cylinderical and ranged from 12 x 64 to

20 x 100 U. Germtubes, commonly, developed from terminal cells.

(4) Artificial inoculation was conducted, using eight methods. The modified technique, which was used for the first time during the present investigation, achieved the highest percentage of infection.

(5) The tested isolates of H. gramineum showed variation of pathogenicity on eleven barley varieties. Different cultural characteristics were also exhibited, as well as dissimilar activities of pectolytic, cellulolytic and oxidative enzymes.

(6) Cultural filtrates of H. gramineum isolates showed distinctly different effects on barley seed germination and morphologic characters of seedlings.

(7) Helminthosporium gramineum was found to attack several genera of Poaceae (Graminaceae). Typical stripe symptoms, however, developed only on barley (Hordeum spp.).

(8) Stripe symptom was coincide with reducion in concentrations of sugars in barley seedlings.

(9) Concentrations of total free amino acids fluctuated during the development stages of stripe infection. Aromatic amino acids contents sharply increased, seven days after inoculation.

(10) Total , free, conjugated and ortho-dihydroxy phenols increased, generally, in infected tissues. It seems that phenolic compounds play an important role concerning the inhibition of development of stripe infection on barley seedlings inoculated with mycelial and spore suspension of H. gramineum.

(11) Changes of poly phenol oxidase activity were undetected in inoculated barley seedlings. Peroxidase showed appreciable increase in changes of activity as a result of inoculation. Changes of catalase activity were more in inoculated tissues than that in uninoculated ones. On the contrary, a sharp decrease of changes of ascorbic acid oxidase was recorded in inoculated tissues.

(12) Out of 100 cultivars and crosses of barley, 48 showed resistance to leaf stripe disease. These varieties can be used as resistant parents in breeding program for developing new resistant varieties.

(13) Stripe infection and mycelial growth of H. gramineum were reduced by using six different fungicides. Vitavax thiram was the most effective fungicide, followed by Vitavax and Dithane M-45.