POLLUTION OF CERTAIN CEREAL FORAGE CROPS WITH FUNGAL PATHOGENS IN EGYPT

BY

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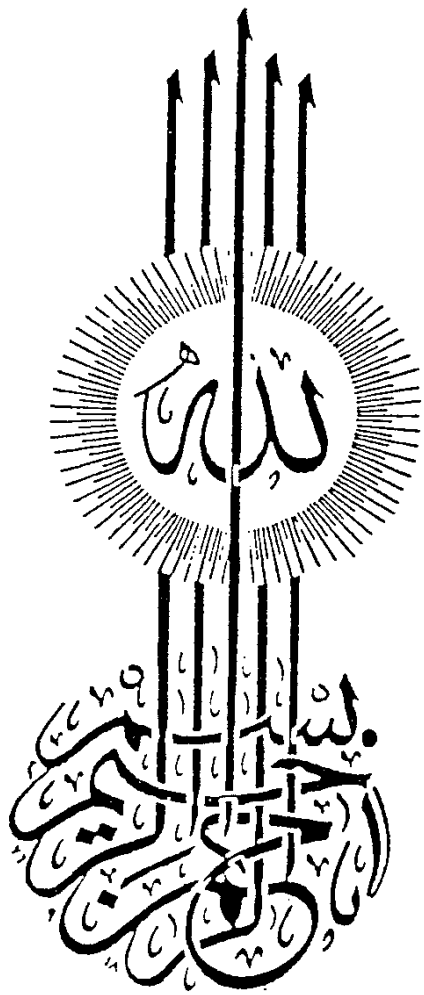

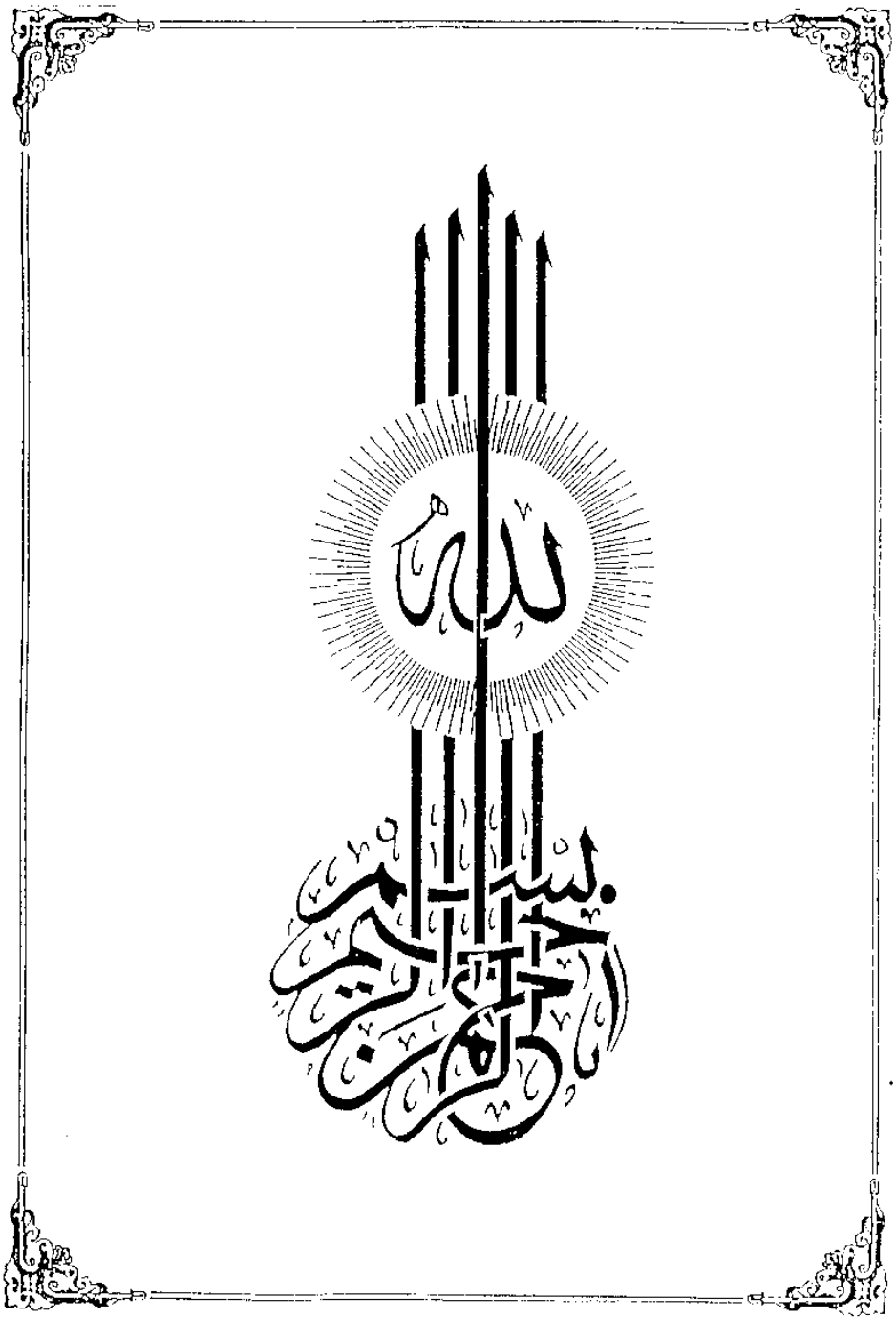

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C O N T E N T S

INTRODUCTION

Cereal forage Crops has been introduced in Egypt on the scale of commercial consumption for cattle feed during the last two decades . However, they are still grown in small acreage but in most of the growing areas in the country during summer season . They are used as plant crop and ratoons and several cuts are taken from the crop . They are planted under variable climatic conditions either geographically or within the same area during changable weather. They are either surface irrigated in the old lands or sprinkler irrigated in the new reclamed lands . The lands in which they are grown are of different soil types and conditions , hence differ in their microflora .

Under this wide range of climatic conditions,cereal forage crops are subjected to variable and several types of pathogenic microorganisms . These organisms affect either the shoot or the root system and cause different diseases . Pathogen behaviour , disease effect and host reaction are in a dynamic interaction affected by and correlated with the ecology factors mentioned above .

Cereal forage crops, in Egypt are attacked by leaf, root and stalk pathogenic fungi . These fungi pollute the crop either directly by their toxic metabolites which lower the crop yield and quality or indirectly through

the use of chemicals to control them and the resulting residues are hazard to animal and man .

The trial to study the contamination of certain cereal forage crops with pathogenic fungi in Egypt aimed, for the first time , to throw lights on the complex of the forage crops, disease agents , and ecology interaction and the process of pollution in the crop .

REVIEW OF LITERATURE

Hosts and Diseases :

In the work embodied in these investigations , only certain fungal leaf spots , stalk-and root-rots of forage crops (millet and sorghum) were considered .

Dickson(1956) reported several diseases attacking millet crops . He mentioned that several species of Helminthosporium have been reported on the millets and closely related species .

Sorghum , Sudan grass and Johnson grass diseases were reviewed by Dickson (1956) . The genus Sorghum contains annual sorghum (sweet sorghum , grain sorghum , broom corn and Sudan grass ; and perennial sorghum or Johnson grass . The crop is cultivated for grain, forage and juice. The physiological anatomy of the sorghums is similar to corn . The seedling development and susceptibility to disease is very similar in the two . Seedling blights and root-rots are important in reducing stands and plant vigor. Among the diseases listed by Dickson are seed rot, seedling blight and root-rot caused by Pythium spp. and other fungi; Gibberella seedling blight and stalk rot caused by Gibberella zeae and Gibberella fujikuroi or Fusarium roseum f. cerealis and F. moniliforme ; Helminthosporium leaf blight caused

by Helminthosporium turcicum ; Anthracnose caused by Colletotrichum spp., Milo root-rot caused by Peroconia circinata ,Charcoal rot caused by Macrophomina phaseoli and other diseases and smuts .

The author , reported that the corn leaf blight caused by H. turcicum occurs sparingly on the sorghums and very extensively on Sudan and Johnson grass . Considerable defoliation results on these two grass sorghums. The lesions are similar to those on corn except for the development of more pigmentation around the margin of the lesions in the sorghum group . Certain of the physiologic races of the parasite on corn infect the sorghum group . The sorghum races of the fungus apparently do not infect corn naturally . According to Chilton (1940) the fungus is seed-borne as well as carried over on crop residue .

Fungi and Diseases :

A- Helminthosporium spp. :

Wallin and Loonan (1973) mentioned that a Helminthosporium sp. resembling , but morphologically different from, H. maydis (Cochliobolus heterostrophus) race T was isolated from a maize leaf . Economic damage was not observed .The fungus produced symptoms resembling southern leaf blight.

Hooker (1974) showed that data obtained for lesion sizes proved that 87 maize hybrids in the seedling stage varied in reaction to inoculation with an Helminthosporium sp. Small lesion size of inbred parents tended to be dominant to large lesion size in hybrids . The reaction of corn inbred lines inoculated in the field with an isolate similar pathogenically to Helminthosporium (Cochliobolus) carbonum race 2 varied in both lesion length and percentage leaf tissue infected , the two reactions were positively correlated .

Nikitina and Kurtseva (1982) mentioned that H. panici-miliacei attacks reproductive organs of Panicum miliaceum at flowering to grain formation . On inoculation of embryos, the fungus causes blackening and brittleness of grain. From the inflorescence , it may spread to cause leaf spot.

Gilchrist, et al.(1984) isolated a Helminthosporium sp. from severe leaf blight infected wheat . It was able to reproduce the characteristic symptoms of the disease : necrotic , oval ellypsoid spots surrounded by a yellowish halo . The fungus was identified as Pyrenophora tritici-repentis (= H. tritici - repentis) .

B - Curvularia spp. :

Komoto, et al. (1980) recorded a new disease of Sudan grass caused by Curvularia lunata and C. intermedia . The