بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

STUDIES ON CHOCOLATE SPOT DISEASE OF BROAD BEAN AND LOSS OCCURRENCE

By

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B.Sc. Agric. (Alexandria University), 1971
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Plant Pathology

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CONTENTS

INTRODUCTION

Faba bean (*Vicia faba* L.) is one of the most important food legume crops in Egypt. In the early decades of this century, faba bean was an important export crop, being shipped principally to the UK as a feed for horses. In the 1920s the crop was grown in over 220,000 ha and a large proportion of the crop was exported. With the rapidly increasing of population, the quantity of faba bean available for export decreased. Therefore Egypt became a major importer after the 1970s. In 1975, 155,000 tons of faba bean were imported and the average of annual importation in the period 1971-1979 was 36400 tons (Watson, 1981).

By the year 1982 the imported amount of faba bean was reduced to 8677 t. In 1983, 9900 tons were exported again*.

The local cultivated faba bean area per season in the last ten years (1986-1995) was 127,000 ha with an average seed yield of 2.51 tons/ha. The total faba bean area in 1994/95 season was about 125,000 ha with an average seed yield 3.14 tons/ha (El-Borai *et al.* 1995), which considered the highest average seed yield in the last ten years.

The bulk of production is harvested as dry seeds and mostly used as a human food in some popular dishes and various other preparations.

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* Second Conference of Agric. Res. Center: March 1984. Paper presented for the development of food legume crops

(Hawtin and Hebblethwaite, 1983). In addition, El-Tobgy (1976) mentioned that about 10% of the area are grown for green consumption. This is mainly due to the high percentage of protein (28%) in the seeds and its low price compared to other protein sources. Also, cultivation of faba bean increased the soil fertility because of high nitrogen fixation capacity.

The most important problems of faba bean production in Egypt were due to pests and diseases which attack the plants. The yield loss due to chocolate spot disease reached more than 50% of the total yield especially under favorable conditions (Mohamed 1982). Also the negliction of applying the recommended cultural practices, may led to some losses.

Chocolate spot disease caused by *Botrytis fabae* is the major problem of the faba bean in Egypt particularly in the high relative humidity and moderate temperature area like Nile Delta. El-Helaly (1936 and 1938) recorded and isolated the causal organism of chocolate spot disease in Egypt.

Intensive research work was conducted on the disease and its effect on yield (Sirry, 1953; Bekhit, 1957; Hegazy, 1964 and Mansour *et al.*, 1976).

Under high relative humidity and high rainfall, the disease may cause severe loss in seed yield. Rizk (1974) reported that yield losses caused by chocolate spot ranged from 40-50% of seed yield in seasons of severe attack and from 5-15% in seasons of mild infection.

Two severe epidemics seasons of chocolate spot disease on faba bean were recorded in Egypt; the first was in 1987/88 and the second was in 1990/91 due to the high relative humidity prevailed. The yield was reduced by 50% in both seasons (Nassib *et al.*, 1991). Therefore, losses due to this disease were undertaken in different levels of infection and under host predisposition.

The main objectives of the present study on faba bean chocolate spot disease were as follow :

1- Some physical studies on the causal organisms.

2- Determination of loss in seed yield of the currently used cultivars using area under disease progress curve (AUDPC). Both field plot experiments and single plant methods were tried.

3- Study the effect of some cultural practices including sowing dates and N-P-fertilizers on disease infection and seed yield loss occurred.

4- Evaluation of the obtained data following statistical analysis using correlation coefficient (r), regression coefficient (b) and coefficient of determination (R^2).

REVIEW OF LITERATURE

Pathogenicity and Symptoms of Faba Bean Chocolate Spot :

Sardina (1930) found that chocolate spot lesions on leaves start as rust coloured to dark-brown spots which become surrounded by an orange-brown ring. Expanded lesions (5-10 mm diameter) have a tobacco-coloured center. Light and dark concentric ridges often develop during lesion expansion.

Wilson (1937) coined the terms 'aggressive' and non-aggressive' to describe rapidly expanding and limited lesions, respectively. Non-aggressive lesions are brown spots which are not expanded or do so only slowly. They are present in most bean crops every year, especially on the leaves. They become more numerous as the season progress. They usually cause little damage (Wilson, 1937 and Harrison, 1981, 1984a).

Under conditions of continuous high humidity, limited lesions become aggressive, darkening and rapidly increasing in size, often causing defoliation and eventually killing the entire shoot system (Wilson, 1937; Yu, 1945 and Harrison, 1980).

Hogg (1956) reported that under favourable conditions (high humidity and low temperature), the disease becomes aggressive causing partial defoliation.

Mansfield and Deverall (1974) found that conidia of *Botrytis fabae* produced spreading lesions at nearly all inoculation sites on leaves grown in greenhouses. The development of lesions produced by *Botrytis cinerea* was more variable.

Causal Organism of Faba Bean Chocolate Spot :

Sardina (1930) was the first to associate Botrytis with chocolate spot disease and gave the name *Botrytis fabae* Sard. to the causal organism. He also reported that *Botrytis cinerea* could cause similar but not identical lesions.

In Egypt, El-Helaly (1936) reported a brown spot of faba beans caused by *Botrytis* sp. which was isolated from leaves and stems. He proved, in 1938, that the causal fungus was *Botrytis fabae* Sard.

In south-west England, Ogilvie and Munro (1946) isolated *Botrytis fabae* from 28 and *Botrytis cinerea* from only 4 out of 32 chocolate spot lesions.

Deverall (1960), and Wastie (1962) showed that when faba bean leaves were inoculated with a given number of conidia, *Botrytis fabae* was much more likely to produce a lesion than *Botrytis cinerea* .

Purkayastha and Deverall (1965), Mansfield and Deverall (1974) and Sumar *et al.* (1982) found that lesions of chocolate spot of faba bean caused by *Botrytis cinerea* always remained small.