

DECLINE OF DATE PALM TREES IN EGYPT

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ABSTRACT

Fusarium moniliforme and *F. solani* were isolated from declined date palm leaves in Egypt. Appeared Symptoms appeared as yellowish streaks and brownish necrosis on leaves, and production of abnormal fruit stalk. Sometimes when the infection starts on the internal leaves it may lead to complete death. Pathogenicity tests proved that both fungi were the causal organisms.

Five fungicides were tested *in vivo*, where thiophanate methyl (Topsin M70) and copper oxide (Coprux) gave the best control.

INTRODUCTION

Since 1982 when El Arosi isolated *Fusarium moniliforme* and *F. solani* no research work was done till Barakat *et al.* (1992) established a new series of work on decline of date palm in Egypt and referred this disease to non identified species of *Fusarium sp.* and other fungi.

During the last samples were received from two localities of date palm plantations suffered from severe decline, isolation tests were conducted and *Fusarium moniliforme* and *F. solani* were only fungi.

MATERIAL AND METHODS

Diseased samples were collected from 2 Governorates i.e. (Qaliobiya and Giza). Isolation was carried out by cutting small pieces (1 cm-long) from infected, surface sterilizing in 5 % sodium hypochlorite for 2 minutes, then washing sterile water. Specimens were then placed onto potato dextrose agar (PDA) plates for three days at 25° C. Fungal colonies were purified by the single spore technique. Identification was verified by the Plant Pathology Research Institute, Giza, Egypt.

Pathogenicity of isolated fungi was tested using 5-month old tissue culture plants, 30-40 cm-long, Zaghlol variety grown at 25[±] °c. The leaf surface was wiped instantaneously with cotton wool saturated with 70 %

ethanol, washed with sterile water and sprayed with a spore suspension adjusted to 7×10^6 spores/ml. Each treatment consisted of 3 plants.

Disease readings in all experiment was recorded as percentage of infected plants.

Disease severity rate (DSR) was determined using the formula suggested by Chastanger and Ogawa (1979) as follows:

$$DSR = \frac{(n \times v)}{(N)}$$

where, N= total of number of infected leaves, n= number of leaves per disease category and v= category number, which was expressed as follows:

0= No of apparent symptoms.

1= Length of lesions ranged from 1-5 cm.

2= Lesion area was 5mm to 5cm and some of small scattering lesion

3= Infection was randomly distributed and infected tissues began to collapse.

4= Half or more of the rachis (leaflet) was still a live.

5= Most of the rachis collapsed and dried.

The effect of five fungicides i.e. thiophanate methyl (Topsin M70), fosietyl aluminum (Aleitte), copper oxide (Coprus), dichlofluanid (Euparien) and triforine (Saprol), on disease incidence in the field was studied during 2000 at Mansoriya – Giza Governorate. The off-shoots were naturally infected with the disease and free of insects or acarides attack. Concentrations of fungicides used were as recommended by the formulators.

The fungicides were sprayed at two consecutive dates; 1st spray at April 2000 , 2nd spray after 21 days from the first spray. Disease readings were taken as follows;

1- before the first spray, 2- before the second spray,

3- after 21 days from the second spray.

RESULTS

Symptoms appeared on the leaves, fruit stalks and the heart of palm tree. The symptoms on the leaves (Fig 1,2) appeared as yellowish brown streaks on the rachis then turn to brown, the later became malformed and dried. The symptoms on fruit stalk appeared as brown necrosis and stunting of new fruit stalks (Fig 3) on the heart the new leaves were weak, yellow to brown in color (Fig 4).

Fusarium moniliforme and *F. solani* were isolated from diseased samples (Table 1) ; among these *Fusarium moniliforme* was the most frequent more than *F. solani* .

Table (1) Frequency of fungi isolated from different infected parts

Fungi Location	<i>Fusarium moniliforme</i>	<i>Fusarium solani</i>
Qanater (Qalubiya)	+++	
El-Mansoriya (Giza)	+++	++

In pathogenicity test, the symptoms developed as brown blotches on the leaves of plants inoculated with *Fusarium solani*. *Fusarium moniliforme* produced slight necrosis, on the bases of leaves (Table 2) .

Table 2. Pathogenicity of the isolated fungi (20 days after inoculation)

Fungi	(DSR)
<i>Fusarium moniliforme</i>	1
<i>Fusarium Solani</i>	2

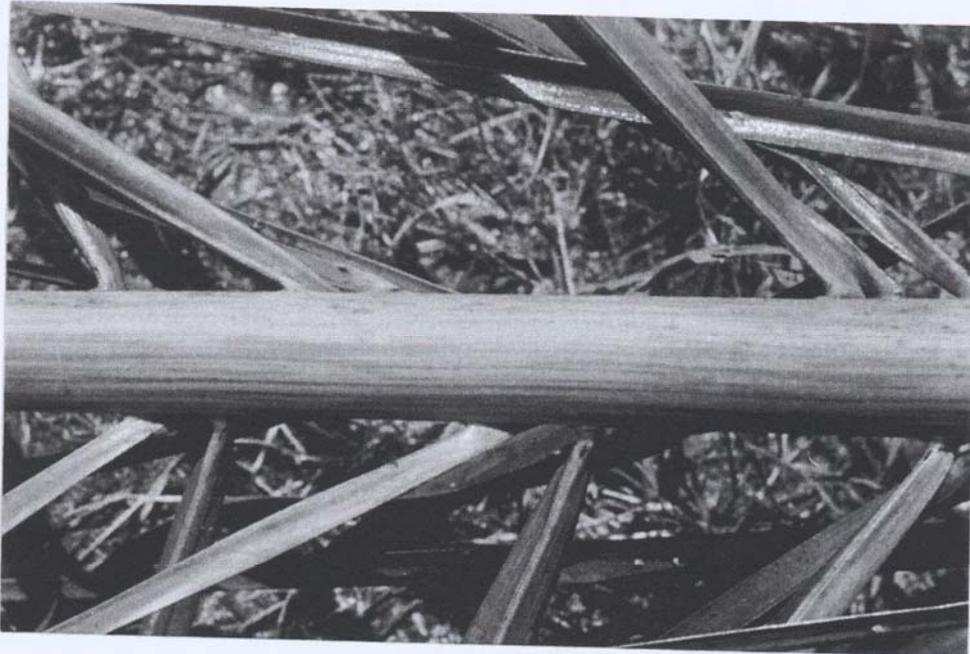


Fig. (1)



Fig. (2)

Fig. (3)

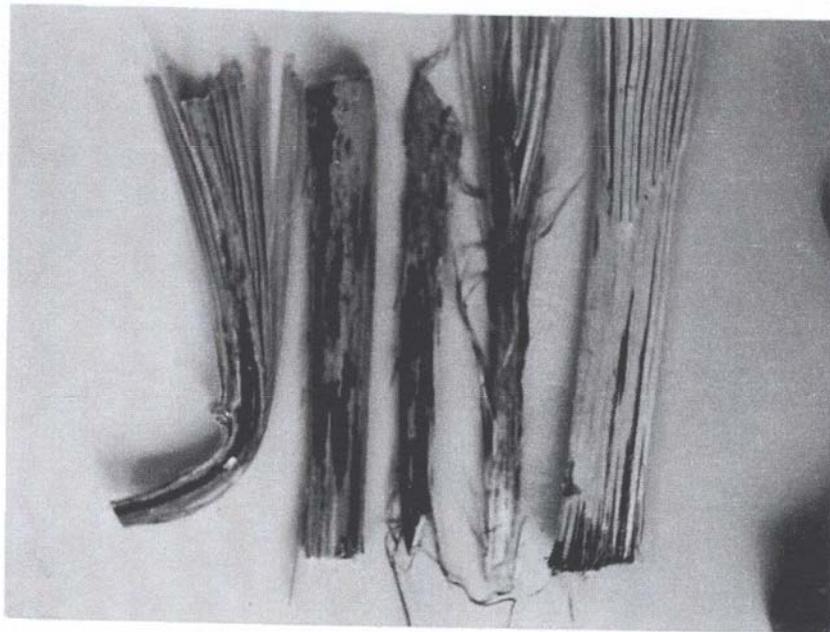


Fig. (4)



Chemical Control

The effect of chemical control in the field Table (3) show that Topsin M70 and Coprus were the most effective fungicides in producing healthy new leaves.

Table 3. Chemical control of naturally infected date palm off-shoots with the disease. (field experiment)

Fungicides	(Common name)	Before treatment	After 21 days from the first spray	After 21 days from the second spray
Topsin M70	Thiophanate methyl	53.33	20.00	3.33
Aliette	Foseityl aluminum	53.00	43.33	30.00
Coprus	Copper oxide	40.00	20.00	6.67
Euparin	Dichlofluanid	53.33	40.00	26.67
Saprol	Triforin	43.33	20.00	13.33
Control		70.00	53.33	33.33

$$\text{Disease severity} = \frac{\text{index} (\%) < (n \times v) 100}{5 N}$$

DISCUSSION

Fusarium moniliforme and *F. solani* fungi was isolated from the declined date palm trees. Pathogenicity test proved a relation between the infection by *Fusarium moniliforme* & *F. solani* and the decline of the target happened. Therefore, this situation was faced by fast control. So we used fungicides *In vivo* which revealed the success of some fungicides as Topsin M&) and Coprus to control the decline of the date palm trees in Egypt.

In previous studies of this problem *Fusarium moniliforme* and *Solani* which associated with El-Wijam disease. (El-Arosi, *et al.* 1982) yet they did not prove that these fungi were the causal of El-Wijam disease or the decline. Also, the study of Barakat, *et al.* (1992) was just the isolation of *Fusarium sp.* and other fungi. It was found that the other fungi as *Botryodiplodia theobronae* was the causal of the decline of date palm off-shoots. This study proved that. *F. moniliforme* and *F. solani* are the only cause of palm trees decline.

Rashed (1998) found that Topsin M70 and Kocide 101 were the best for the therapy of palm trees diseases specially black scorch disease. In this study Topsin M70 and Coprus were the best fungicides to control the decline of date palm.

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