

## SURVEY AND CONTROL TRIALS OF ROOT ROT / WILT OF DATE PALM OFFSHOOTS IN NEW VALLEY GOVERNORATE

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### Abstract

Root rot/wilt of date palm offshoots was surveyed during seasons of 2011 and 2012 starting from March to October in nurseries and orchards in different major areas of the New Valley Governorate (at El-Kharga, Paris, El-Dakhla, El-Farafrah and Eastern Owinat). The average percentage of disease incidence ranged between 48.0 and 68.6% and the severity of the disease ranged between 37.7 and 53.7%. Eleven fungal species were isolated from rotted roots of diseased offshoots. Frequency of the isolated fungi varied according to the locality, where *Fusarium oxysporum* was the most frequent fungus in all localities followed by *F. solani*, *F. moniliforme*, *F. semitectium*, and *F. equiseti*. Pathogenicity tests showed that *Fusarium oxysporum*, *F. solani*, *F. moniliforme*, *F. equiseti* and *F. semitectium* were pathogenic to date palm offshoots, but they differed in their pathogenic potentials. *Fusarium oxysporum*, *F. solani* and *F. moniliforme* caused the highest disease incidence and severity. Efficiency of five different fungicides (*Kemazed*, Maxim XL, Moncut, Rizolex T and Topsin M<sub>70</sub>) varied in reducing the disease., *Kemazed*, Maxim XL Rizolex-T and Topsin M<sub>70</sub> at conc. 100-200 ug/me and Moncut at 200 ug/me completely inhibited growth of the tested fungi in *vitro*. Under field conditions, Topsin M<sub>70</sub>, Maxim XL, Rizolex-T and *Kemazed*, were the most effective fungicides in controlling root rot and wilt of date palm offshoots.

**Keywords:** Date palm disease, Root rot, wilt, Saidy and Barhee varieties, fungicides.

### INTRODUCTION

Several soil-borne pathogenic fungi attack date palm (*Phoenix dactylifera* L) trees and offshoots at different regions around the world causing severe losses and deterioration of trees and new offshoots. Zaid, *et. al.* (2005) reported *Fusarium oxysporum f. sp. albedinis* as main causal fungal pathogen of "Bayoud" disease that affects date palm productivity in Morocco. Also, *F. oxysporum*, *F. solani*, *F. moniliforme*, *F. equiseti*, *F. semitectium*, *F. xylairoides*, *F. proliferatum*, *Rhizoctonia solani*, *Acremonium sp.*, *Gliocladium sp.* and *Chaetomium sp.*, were reported in different countries to cause root rot and wilt of young and adult date palm trees. (Rashed and Abd El-Hafeez, 2001; Sarhan, 2001; El-Deeb, *et. al.*, 2006; Mansoori and Kord, 2006; Arab, *et. al.*, 2007, Sabet, *et. al.*, 2007, El-Morsi, *et. al.*, 2009, Fahed and Yahia, 2010 and Abul-Soad *et. al.*, 2011).

In recent years, under conditions of high temperature and low relative humidity in the New Valley Governorate, death of date palm offshoots has been observed in new offshoots plantations before and/or after transplantation to nurseries or permanent orchards. The disease causes yellowing or whitening of leaves followed by death of the infected offshoots. A survey was carried out in the years of 2011 and 2012 (starting from March to October), showed that most of the affected plantations had water-logged and/or saline soils. In infected plantations wilt and death offshoots were associated with root rots. Sometimes, the same problem was observed in older plantations but date palm trees were not severely affected. To overcome this problem chemical control of the disease was advised (Al-Yasiri, *et. al.* 2010; Abul-Soad *et. al.* 2011).

The present work was planned to survey the problem and evaluate the effectiveness of certain fungicides as single treatments on the root rot disease and wilt of date palm offshoots in New Valley Governorate, Egypt.

## **MATERIALS AND METHODS**

### **1- Diseases survey**

Disease survey was carried out in five major areas in the New Valley Governorate during two successive years (Starting from March to October 2011 and 2012). Saidy variety is usually cultivated in El-Kharga, Paris, El-Dakhla and El-Farafrah while Barhee variety is common in the Eastern Owinat. Date palm offshoots, showing symptoms of root rots and/or rachides wilt were recorded in nurseries and orchard of the surveyed localities and mean percentages of disease incidence were calculated. Diseased samples were also collected for isolation. Disease severity (D.S.) was calculated according to El-Morsi, *et. al.* (2009) on naturally infected date palm offshoots by using the following formula: Disease severity (%) =  $(\sum (n \times v) / N \times V) \times 100$  Where, (n) = the number of diseased offshoots per category, (v) = category number, N = total number of the offshoots, (V) = Maximum disease severity rate. Disease severity was assessed on date palm offshoots exhibiting typical symptoms of wilt and root rot. Foliar symptoms including gradual yellowing, wilt or dieback and death of rachides were evaluated on a scale of 0-4 based on the percentage of the affected foliage, where 0 = offshoots healthy, 1 = from 0 to 25% (mild symptoms), 2 = from 26 to 50 % (moderate symptoms), 3 = from 51 to 75% (severe symptoms), 4 = more than 76% diseased foliage (offshoots nearly dead to dead).

## **2- Isolation, purification and identification of the causal fungi**

The collected diseased samples were thoroughly washed under running tap water, cut into small pieces (1 cm), and surface sterilized by dipping in 0.1% mercuric chloride solution for 2 minutes, then washed in several changes of sterile distilled water. The sterilized pieces were dried, transferred to Petri dishes, each containing 20 ml potato dextrose agar (PDA) and incubated at 27°C for 5 days. The developed fungal colonies were purified using hyphal tip or single spore techniques. Identification was made according to the morphological and microscopical characteristics as described by Barnett and Hunter (1986), Booth (1971) and Sneh *et. al.* (1991) and were further authenticated by the Botany Department, Faculty of Science, Assiut University. The obtained isolates were maintained at 5°C on PDA slants for further study. The frequency of each isolated fungi was recorded.

## **3- Pathogenicity tests**

The pathogenic potential of the isolated fungi was evaluated under greenhouse conditions at El-Kharga Agriculture Research Station. Date palm seeds (Saidy var.) were treated with dry heat at 45°C for 2 hours to induce seed germination. Plastic pots (30 cm in diam.) were filled with autoclaved soil (2Kg/pot) , infested separately with the fungus in concern seeded with one seed/ pot and then watered three times a week. Propagation of the tested fungi was made on autoclaved barley grain medium, in 500 ml flasks for 15 days at 27°C, and were added separately at the rate of 5% of soil weight. The pots were irrigated regularly for three times a week before planting to ensure even distribution of the inoculated fungus in the soil.. Five pots were used as replicates for each fungus. Other group of pots containing uninoculated medium was kept as control. Percentages of infection and disease severity were recorded, three months later. Re-isolation was carried out from infected roots showing disease symptoms and the isolated fungus was compared with the original culture used.

## **4- Disease control**

Five fungicides (Table 1) were evaluated *in vitro* and *in vivo* to control root rot wilt date of palm offshoots.

### **A) *In vitro***

Three different concentrations 50, 100, 200 ug / ml of each of the tested fungicides were added to PDA medium before solidification, then medium was dispensed in (9 cm in dia.) Petri dishes. Disks, 5 mm in diameter, taken from 7 days old cultures of the tested fungi were transferred to the center of PDA plates and incubated at 27°C. Six replicates were used for each treatment. Control plates were prepared in the same way on PDA medium devoiding the fungicide. Radial fungal

growth was recorded after 7 days incubation and the percentage of reduction in mycelial growth were calculated.

### **B) *In vivo***

The experiment was conducted in two nurseries of date palm offshoots (planted with Saily and Barhee varieties) located at El-Kharga Agriculture Research Station during 2011. Date palm offshoots (3 years old) without any sign of insect infestation were used. Recommended rates of the tested fungicides (Table, 1) were used. The selected offshoots of both varieties exhibited varied degrees of wilt symptoms. Disease severity due to natural infection was recorded before any treatment. The selected date palm offshoots of both varieties were treated through soil drench three times at 15 day intervals with recommended dose of the tested material one day after irrigation (3 liter/ offshoot). Untreated soil was used for control. Six replicates were used for each treatment. Percentages of disease severity (DS) and decrease in disease incidence (PD) were calculated 60 days after each treatment as follows:  $PD = (Ds_1 - Ds_2 / Ds_1) \times 100$  whereas, PD = % decrease in disease incidence,  $Ds_1$  = Disease severity before treatment (zero time) and  $Ds_2$  = Disease severity after a given treatment.

### **Statistical analysis**

Data were subjected to statistical analysis using analysis of variance and means were compared using L.S.D. test (Steel and Torrie, 1980).

Table 1. Trade name, common name, active ingredient % and recommended doses of the used fungicides.

Trade name	Common name	% Active ingredient	Recommended rate in orchard
Kemazed	Carbendazim	50% WP	3 gm / L
Maxim XL	Fludioxonil + Meffnoxam	3.5% FS	1 ml / L
Moncut	Flutolanil	25% WP	3 gm / L
Rizolex -T	Tolclofos methyl + Thiram	50% WP	3 gm / L
Topsin M <sub>70</sub>	Thiophanate methyl	70% WP	1.5 gm / L

## **RESULTS**

### **1- Survey of the disease**

Data in Table (2) indicate that the percentage of disease incidence and severity of the disease varied according to the locality. The percentage of disease incidence ranged from 46.4% in Paris area to 67.3% in El-Kharga area during year 2011 and from 49.6.4% at Paris area to 70.0% in El-Kharga area in year 2012.

The same trend was detected with the percentage of disease severity which ranged from 35.5% in Paris location to 51.2% in El-Kharga location during year 2011, and 39.9% in Paris to 56.2% in El-Kharga during year 2012. El-Kharga and El-Dakhla areas showed the highest mean percentages either in disease incidence or disease severity (68.6, 66.5 and 53.7, 52.7%, respectively), followed by Eastern Owinat area (63.7. and 48.8%, respectively), while Paris area revealed the lowest occurrence (48.0 and 37.7%). It was also clear from Table (2) that disease incidence and severity were slightly higher in year 2011 (62.8 and 50.1%) than year 2012 (59.8 and 45.5%).

In general, the disease incidence and severity differed at the five inspected localities. The highest means of both disease incidence and severity were recorded on offshoots grown in El-Kharga area (68.6 and 53.7%, respectively) and the lowest were recorded on offshoots grown at Paris area (48.0 and 37.7%, respectively).

Table 2. Survey of root rot wilt disease of date palm offshoots in New Valley Governorate during the years 2011 and 2012.

Localities	Varieties	Disease incidence		Mean	Disease severity		Mean
		(%)			(%)		
		2011	2012		2011	2012	
El-Kharga	Saidy	67.3	70.0	68.6	51.2	56.2	53.7
Paris	Saidy	46.4	49.6	48.0	35.5	39.9	37.7
El-Dakhla	Saidy	63.4	69.7	66.5	50.4	55.1	52.7
El-Farafrah	Saidy	59.6	59.8	59.7	42.8	49.5	46.1
E. Owinat	Barhee	62.4	65.0	63.7	47.7	50.0	48.8
Mean		59.8	62.8	61.3	45.5	50.1	47.8
L.S.D 0.05		2.6	3.1		2.8	3.2	

## 2- Fungi isolated from naturally infected samples

A list of isolated fungi from different localities is shown in Table (3). It included *Acremonium egyptina*, *Cylindrocarpon sp.*, *Chaetomium globosum*, *Fusarium equiseti*, *F. moniliforme*, *F. oxysporum*, *F. semitiectium*, *F. solani*, *Gliocladium roseum*, *Macrophomina phaseolina* and *Rhizoctonia solani*. Isolation frequency varied according to locality. In general, *Fusarium* species were the most common fungi in the surveyed areas. *Fusarium oxysporum* was the most frequently isolated one (22.2%) followed by *F. solani* (19.4%), *F. moniliforme* (17.9%) and *F. equiseti* (16.4%). Also, *F. semitiectium* was recorded at moderate frequency (13.3%). *Rhizoctonia solani*, *Chaetomium globosum*, *Cylindrocarpon sp.*, *Gliocladium roseum*, *Macrophomina phaseolina*, and *Acremonium egyptina* were recorded at low frequencies (3.3, 2.1, 1.8, 1.7, 1.5 and 0.4%, respectively).

Table 3. Frequency of fungi isolated from naturally infected samples of date palm offshoots collected from different localities in New Valley Governorate.

No.	Localities Isolated fungi	Frequency of fungi isolated %										% Mean
		Kharga		Paris		Dakhla		Farafrah		Owinat		
		%	N.I*	%	N.I*	%	N.I*	%	N.I*	%	N.I*	
1	<i>Acremonium egyptina</i>	1.0	5	1.1	4	0	0	0	0	0	0	0.4
2	<i>Cylindrocarpon sp.</i>	2.0	10	1.3	5	1.8	8	1.6	10	2.2	11	1.8
3	<i>Chaetomium globosum</i>	3.5	17	2.0	8	2.2	10	2.6	17	0	0	2.1
4	<i>Fusarium equiseti</i>	13.7	67	16.6	63	16.0	72	18.0	115	17.6	87	16.4
5	<i>F. moniliforme</i>	18.0	88	17.1	65	17.8	80	18.8	120	17.8	88	17.9
6	<i>F. oxysporum</i>	23.3	114	20.8	79	23.1	104	20.6	132	23.1	115	22.2
7	<i>F. semitectium</i>	13.3	65	16.6	63	12.9	58	12.5	80	11.5	57	13.3
8	<i>F. solani</i>	18.6	91	19.5	74	19.3	87	18.9	121	20.4	101	19.4
9	<i>Gliocladium roseum</i>	2.5	12	1.6	6	2.0	9	2.6	17	0	0	1.7
10	<i>Macrophomina phaseolina</i>	1.63	8	1.1	4	1.3	6	1.1	7	2.6	13	1.5
11	<i>Rhizoctonia solani</i>	2.65	13	2.4	9	3.5	16	3.3	21	4.8	24	3.3
Total Frequency %		100		100		100		100		100		100
The total number of fungal colonies *			490		380		450		460		496	
The total number of examined date palm offshoots		352		225		245		320		452		
Multiple infections		+		+		+		+		+		

N.I\*: Number of isolates.

### 3- Pathogenicity tests

Table (4) show that *Fusarium equiseti*, *F. moniliforme*, *F. oxysporum*, *F. semitectium* and *F. solani* are involved in incidence of root rot and wilt disease complex of date palm seedlings of var. Saïdy. Root rots were characterized by light to dark colored roots associated with foliar wilt symptoms. *Fusarium oxysporum*, *F. solani* and *F. moniliforme* caused the highest root rots percentages (100 and 80.0%) and disease severity (83.9, 81.8 and 71.7%, respectively); however, *F. equiseti* caused a moderate percentage of disease incidence and severity (60 and 51.3 %, respectively). The disease percentage and severity caused by *F. semitectium* were the lowest (40 and 31.2 %, respectively). Reisolation from infected tissues yielded the same fungi originally inoculated. On the other hand, *Acremonium egyptina*, *Cylindrocarpon sp.*, *Chaetomium globosum*, *Gliocladium roseum*, *Macrophomina phaseolina* and *Rhizoctonia solani* were non pathogenic.

Table 4. Pathogenicity of fungi isolated from diseased samples collected from date palm offshoots on date palm seedlings var. Saidy under greenhouse conditions.

No.	Isolated fungi	Disease incidence (%)	Disease severity (%)
1	<i>Acremonium egyptina</i>	Non pathogenic	Non pathogenic
2	<i>Cylindrocarpon sp.</i>	Non pathogenic	Non pathogenic
3	<i>Chaetomium globosum</i>	Non pathogenic	Non pathogenic
4	<i>Fusarium equiseti</i>	60	51.3
5	<i>F. moniliforme</i>	80	71.7
6	<i>F. oxysporum</i>	100	83.9
7	<i>F. semitectum</i>	40	31.2
8	<i>F. solani</i>	100	81.8
9	<i>Gliocladium roseum</i>	Non pathogenic	Non pathogenic
10	<i>Macrophomina phaseolina</i>	Non pathogenic	Non pathogenic
11	<i>Rhizoctonia solani</i>	Non pathogenic	Non pathogenic
<b>Control</b>		0.0	0.0
<b>L.S.D. at 0.05:</b>		5.06	5.36

#### 4- Effect of certain fungicides on growth of three pathogenic fungi in *vitro*

Data presented in Table (5) indicate that the used concentrations of the tested fungicides significantly reduced the linear growth of the tested fungi. Tolerance of tested fungi to low concentration of fungicides varied. Complete inhibition of the growth of *Fusarium moniliforme* was recorded with 50 ug/ml of Maxim XL and Topsin M<sub>70</sub>. Complete growth inhibition of the other tested fungi was achieved with 100 and 200 ug/me except Moncut at 100 ug/ml against *F.oxysporum* and *F. solani*.

Table 5. Effect of fungicides concentrations on the pathogenic fungi in vitro.

Tested materials (A)	Reduction in linear growth (%)								
	<i>F. moniliforme</i>			<i>F. oxysporum</i>			<i>F. solani</i>		
	50	100	200	50	100	200	50	100	200
Kemazed	79.3	100	100	66.4	100	100	69.6	100	100
Maxim XL	100	100	100	69.2	100	100	80.0	100	100
Moncut	73.3	100	100	43.3	70.5	100	54.4	75.0	100
Rizolex T	82.6	100	100	59.2	100	100	64.6	100	100
Topsin M <sub>70</sub>	100	100	100	62.9	100	100	73.3	100	100
Control	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L.S.D at 0.05:									
Tested materials (A) =	2.60			2.42			2.33		
Concentration (C) =	1.59			1.49			1.43		
A x C =	4.50			4.50			4.04		

### 5- Effects of certain fungicides in controlling the disease

Results in (table 6) show that all tested fungicides reduced incidence of root rot and wilt date palm offshoots of Saidy and Barhee varieties under field conditions. Efficiency of the tested materials in controlling the disease varied. Maxim XL, Topsin M<sub>70</sub>, and Rizolex-T resulted in the highest decrease in disease incidence, followed by Kemazed, while Moncut gave the least decrease in disease incidence. In case of Barhee variety, Topsin M<sub>70</sub>, Maxim XL and Rizolex-T gave the least disease severity and highest decrease in disease incidence, followed by Kemazed, while Moncut gave the least decrease in disease incidence.

Table 6. Effect of certain fungicides as soil treatment on disease severity of root rot wilt complex of date palm offshoots in the orchard.

Tested materials (A)	Saidy variety			Barhee variety			Mean
	Disease severity (%)		Decrease in disease incidence (%)	Disease severity (%)		Decrease in disease incidence (%)	
	Control	60 day after treatment		Control	60 day after treatment		
Kemazed	58.3	14.3	75.5	67.3	12.5	81.4	78.4
Maxim XL	69.1	4.3	93.8	54.1	4.5	91.7	92.7
Moncut	62.8	18.4	70.7	65.0	15.9	75.5	73.2
Rizolex T	65.5	5.3	91.9	60.2	5.2	91.4	91.6
Topsin M <sub>70</sub>	61.3	4.1	93.3	69.3	5.4	92.2	92.7
Control	72.5	87.5	-	78.7	90.0	-	-
L.S.D at 0.05: Tested materials (A) =	2.083			3.410			
Time of treatment (B) =	1.113			1.857			
A x B =	2.729			4.545			

### DISCUSSION

Survey of root rot wilt disease complex of date palm offshoots in different localities of New Valley Governorate was conducted during years 2011 and 2012 (Starting from March to October). Results reported herein indicated that such a disease may be considered one of the most important fungal diseases in the New Valley Governorate, since it cause a major problem on young date palm offshoots. The disease incidence and severity were different in the five inspected localities, the highest means of disease incidence and severity were recorded in El-Kharga area followed by El-Dakhla and Eastern Owinat, while the lowest incidence and severity of



the disease were recorded on offshoots grown at Paris area. Such results are in line with those reported by Rashed and Abd El-Hafeez (2001), Sarhan (2001), El-Deeb, *et al.* (2006), Mansoori and Kord (2006), Arab, *et al.* (2007), Sabet, *et al.* (2007), El-Morsi, *et al.* (2009), Bokhary (2010), Fahed and Yahia (2010) and Abul-Soad *et al.* (2011). The recorded differences in occurrence of the disease on date palm offshoots in different New Valley areas may be due to differences in environmental factors that existed among areas and farming procedures as well.

Eleven fungal species belonging to seven fungal genera were recovered from rotted root samples collected from date palm offshoots. Frequency of the isolated fungi was variable. *Fusarium oxysporum* was the most frequently isolated fungus, followed by *F. solani*, *F. moniliforme*, *F. semitectium* and *F. equiseti*.

Pathogenicity tests proved that *Fusarium equiseti*, *F. moniliforme*, *F. oxysporum*, *F. semitectium* and *F. solani* were pathogenic on var. Saidy and showed typical symptoms of root rot and wilt characterized by light to dark color and foliar wilting symptoms. *Fusarium oxysporum*, *F. solani* and *F. moniliforme* caused the highest root rot percentage and highest severity showing extensive root and crown necrosis on tested date palm seedlings, whereas the disease incidence percentage and severity caused by *F. semitectium* was the lowest. Variation existed in pathogenic potential of the tested species of *Fusarium* was previously mentioned by Rashed and Abd El-Hafeez (2001), Sarhan (2001), Mansoori and Kord (2006), Arab, *et al.* (2007) Bokhary (2010), Fahed and Yahia (2010) and Abul-Soad *et al.* (2011).

Results of the *in vitro* evaluation of toxicity of certain systemic fungicides against root rot and wilt fungi indicated that the tested concentrations of the tested fungicides reduced significantly the linear growth of the tested pathogenic fungi. Tolerance of the tested fungi to the tested doses of fungicides was different. Complete inhibition of growth of *Fusarium moniliforme* was achieved by 50 ug/me of Maxim XL and Topsin M<sub>70</sub> compared to other concentrations, 100-200 ug/me, of Kemazed, Maxim XL, Rizolex T, Moncut and Topsin M<sub>70</sub>. Efficiency of the tested chemicals in controlling root rot and wilt disease complex of date palm offshoots varied accordingly. Topsin M<sub>70</sub>, Maxim XL and Rizolex-T were the best of the tested materials to control root rot and wilt on date palm offshoots. The fungicides Topsin M<sub>70</sub>, Maxim XL, Rizolex-T, Kemazed and Moncut, greatly reduced the disease incidence. Mode of actions of the tested fungicides on fungi are different. FRAC (2011) reported that Topsin M<sub>70</sub> and Kemazed arrests mitosis and cell division of the tested fungi, Maxim XL affects fungal map/ protein-kinase in osmotic signal transduction, Moncut affects complex II in fungal respiration (succinate dehydrogenase) and Rizolex-T affects fungal lipids and membrane synthesis. Such

results are in agreement with those reported by Rashed, Abd El-Hafeez (2001), Al-Yasiri, *et. al.* (2010) and Abul-Soad *et. al.*, (2011). Variation in efficiency of the tested fungicides in controlling the root rot and wilt disease complex under a nursery and/or field conditions may be due to differences in the tested pathogens and mode of action of the tested fungicides.

It could be suggested that treating date palm offshoots with certain chemicals be used commercially for controlling root rot and wilt disease complex under a nursery and/ or field conditions.

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## مرض عفن الجذور والذبول على فسائل نخيل البلح و مكافحته

### بمحافظة الوادى الجديد

مجد المرسي عوض المرسي ، محسن السيد على أبو رحاب ، سامي عبد الفتاح المرسي

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اجريت هذه الدراسة خلال عامي 2011 و 2012 لحصر مرض عفن الجذور والذبول الذى يصيب فسائل نخيل البلح الصعدي والبرجى بمحافظة الوادى الجديد وتعريف الفطريات المسببة له فى مشاتل ويساتين خمسة مناطق رئيسية ممثلة للمحافظة هى الخارجة وباريس والداخلة والفرافرة وشرق العوينات ، وكذلك تقييم كفاءة بعض المبيدات الفطرية فى مكافحة المرض. وتبين تواجد مرض ذبول وأعفان جذور فسائل نخيل البلح بدرجات متفاوتة فى كل المناطق التى شملها الحصر ، حيث تراوح المتوسط العام لنسبة الإصابة بالمحافظة ما بين 48-68.6% وشدة الإصابة على الفسائل المصابة ما بين 37.7-53.7% ، وتم عزل عدة أنواع لأجناس فطرية مختلفة من العينات المصابة كان الفطر فيوزاريوم اوكسيسبورم هو السائد يليه الفطر فيوزاريوم سولانى واختلف التوزيع التكرارى للفطريات المعزولة تبعا لاختلاف أجناسها والمناطق المعزولة منها ومواقع العزل سواء المشاتل أو البساتين. وباختبار القدرة المرضية للفطريات المعزولة على شتلات بذرية للصنف الصعدي تحت ظروف العدوى الصناعية بالصوبة ثبت أن الفطريات فيوزاريوم اوكسيسبورم وفيوزاريوم سولانى وفيوزاريوم مونليفورم وفيوزاريوم اكويسى وفيوزاريوم سيمتيكتم مسببات لمرض ذبول وأعفان الجذور على فسائل نخيل البلح فى محافظة الوادى الجديد. تم دراسة تأثير خمس مبيدات فطرية مختلفة (كيمازد- مون كت- ماكسيم اكس ال- ريزولكس تى- وتوبسين ام70) على تثبيط نمو الفطريات الممرضة المختبرة تحت ظروف المعمل وخفض شدة المرض فى المشتل، وتبين أن كل التركيزات المختبرة للمبيدات الفطرية المختبرة كان لها قدرة عالية على تثبيط نمو الفطريات الممرضة فى المعمل ولكن بدرجات متباينة. كما أظهرت المبيدات الفطرية المختبرة (كمعاملة تربة) كفاءة متباينة فى مكافحة المرض على فسائل نخيل البلح (للصنفين الصعدي، والبرجى) فى المشتل، وكانت أفضل المواد المختبرة فى مكافحة المرض هى: توبسين م70، وماكسيم اكس ال، وريزولكس تى.