

Efficacy of dressing cotton seeds with fungicides in controlling root pathogens under field conditions

By

*Eisa (Nawal) A., *El-Habbaa, G.M., **El-Emery, M.I. and ** Hassan, S.R.

*Agric. Botany Dept., Plant Pathology Branch, Fac. Agric., Benha University

** Field Crops Research Institute, Agric. Res. Center, Giza, Egypt.

ABSTRACT

Treating cotton seeds with fungicides reduced damping-off incidence under field conditions. Maxim and Topsin-M followed by Vitavax-T70 were the most effective fungicides on reducing damping-off incidence of cotton plants (cvs. Giza-86 and Giza-89) during growing seasons 2000 and 2001. Meanwhile, treating cotton seeds with fungicides before sowing for controlling root rot pathogens increased also plant height, number of fruiting branches, number of the opened bolls/plant, weight of yielded cotton for each boll, cotton yield (g)/plant, average yield of cotton lint (g)/plant, yield of cotton seeds (g)/plant, yield of cotton (kantar/feddan), yield of cotton lint (kantar/feddan), yield of cotton seeds (kg/feddan) and fiber length and strength of yielded cotton of both cotton cvs. (Giza-86 and Giza-89) during the two growing seasons. Generally, Vitavax-T70 and Vitavax-T40 were the best seed treatments comparing with many of the tested fungicides, *i.e.*, Maxim, Topsin-M and Rizolex-T as well as un-treated control in this respect.

Key words: cotton crop quality, fungicides, damping-off disease, seed dressing.

INTRODUCTION

Cotton (*Gossypium hirsutum* L.) is attacked by several pests such as insects, fungi, bacteria, nematodes and others at the different stages of growth. Fungi are the widest pathogens but bacteria and viruses are sometimes involved. In this respect, **Fulton and Bollenbacher (1958)**, **Alfred (1963)**, **Kuch (1986)**, **Seneewong *et al.* (1991)**, and **Palmateer *et al.* (2004)** found that *Rhizoctonia solani*, *F. moniliforme*, *Fusarium solani*, *F. semitectum* were the most pathogenic fungi causing mortality of cotton plants.

Regarding the effect of fungicides, **David and Sinclair (1968)** reported that protection against pre- and post-emergence damping-off occurred when seedlings were grown in soil treated with 250 ppm Vitavax while, Vitavax used as seed treatment gave significantly greater protection than did a standard. **Barakat and Osman (1981)** found that dressing of cotton seeds with any of the fungicides Captan, Quinolate 15 and Euparen has significantly improved the emergence of seedlings, but thiabendazole (TBZ) was ineffective. All applied fungicides did not affect root or shoot lengths comparing with the control plants. Dry weight of shoots was reduced especially with Euparen and Quinolate 15 treatments. **Youssef *et al.* (1995)** found that delinting the seeds of Egyptian cotton cvs. Giza-45 and Giza-75 by the brush machine for one and two times before coating with the Monceren fungicide improved seed germination and seedling growth characteristics as compared to the acid delinted seeds or the non-delinted ones. **Helal *et***

al. (1997) found that dressing the delinted cotton seeds with Rizolex before planting in infested and non-infested soil in the greenhouse gave the highest seedling emergence and the highest percentage of survived seedlings as well as, delinted seeds with 50% sulfuric acid gave the lowest rate of diseased seedlings. Seed dressing improved seedling vigor in the greenhouse. **El-Safety et al.** (2001) reported that dressing cotton seeds with fungicides Monceren, Monceren-combi, Monceren-euparen, Rhizolex-T and Vitavax 300 as well as using the fertilizer superphosphate and herbicides (cotoran, goal and stomp) in a soil infested with *Rhizoctonia solani* have significantly reduced the infection. **Goulart** (2002) conducted an experiment in greenhouse to evaluate the efficiency of several fungicides, applied as seed dressing to control damping-off caused by *R. solani* using the cotton cv. Delta Opal. The most efficient treatments in the control of cotton seedling post-emergence damping-off were triadimenol + pencycuron + tolylfluanid followed by triadimenol, triadimenol + tolylfluanid and carboxin + thiram. No phytotoxic effects were observed on cotton.

This work aimed to study the efficacy of some commercial fungicides in controlling root rot incidence under field conditions and its effect on plant growth and lint quantity and quality.

MATERIALS & METHODS

Effect of some fungicides on damping-off incidence, cotton yield components and fiber quality under field conditions:

The effect of some fungicides i.e., Maxim (fludioxonil-metalaxyl 3.5%, Syngenta, Switzerland), Rizolex-T (tolclofos-methyl+ thiram, 50%, Sumitomo, Japan), Vitavax-T70 (carboxin + thiram, 75%, Mniroyal, England) and Vitavax-T40 (carboxim + thiram, 40%, Mniroyal, England) on root-rot incidence under field conditions was carried out during 2 successive seasons (2000/01). Cotton seeds cvs. Giza-86 and Giza-89 obtained from Field Crops Research Institute, Agric. Res. Center, Giza, Egypt were mixed with the tested fungicides at the recommended doses plus an adhesive material (10 ml/kg seed) in a closed glass container and then shaken vigorously for 10 minutes. After seed dryness, Seeds were planted in naturally infested field at Sakha Agricultural Research Station, Kafr EL-Sheikh, Egypt. The experiment was designed in complete randomized block design with three randomized replicates for each treatment. Experimental plot was 3 x 5.5 m² containing 3 rows and 20 cm apart between hills. The normal field practices of cotton cultivation (including irrigation, fertilization and pest control) were performed as recommended by the field crops institute (ARC), Giza. Each plot was planted with 375 cotton seeds at the rate of 125 seed/row (five seeds/hill). Percentages of damping-off (pre- and post-emergence damping-off) were recorded after 21 days from sowing, and the percentages of survived plants were determined 45 days after sowing. Plant height, number of fruiting branches, number of bolls/plant, cotton weight/ boll, cotton yield/plant, cotton lint/plant, cotton seeds/plant, cotton yield/feddan, cotton lint/feddan and cotton seeds/feddan as affected by different treatments were also determined at harvesting stage (approx. 180 days). Fiber length and fiber strength for each treatment was measured by the aid of Cotton Technology Institute, ARC, Giza.

Statistical analysis:

Field experiments under study were performed in a complete randomized block design. All data were analyzed according to **Snedecor and Cochran (1989)**.

RESULTS

Effect of some fungicides under field conditions:

1- Effect on disease incidence:

Data in **Table (1)** indicate that all the tested fungicides affected positively damping-off incidence under field conditions. In this respect, Maxim was the most effective fungicide in reducing disease incidence of cotton plants where it gave the highest percentages of survived plants of cotton cvs. Giza-86 and Giza-89 during the both growing seasons of 2000/01 being 76.6 & 78.0% and 80.7 & 82.0%, respectively. Meanwhile, Topsin-M70 followed by Maxim in this respect without significant differences. Slight difference was noticed between Vitavax-T70 and Maxim or Topsin-M70. Rizolex-T was the least effective fungicide, where the survived plants were 64.7 and 71.4% during 2000 growing season and 72.0 and 69.6% during season 2001 for both cvs. Giza-86 and Giza-89, respectively.

Table (1): Effect of some fungicides on damping-off incidence of two cotton cvs under field conditions during 2000- 2001 growing seasons

Treatments	% Disease incidence and survived plants								
	Season 2000			Season 2001			Mean		
	Pre	Post	Sur.	Pre	Post	Sur.	Pre	Post	Sur.
cv.Giza-86									
Maxim	16.7	6.7	76.6	16.0	3.3	80.7	16.4	5.0	78.7
Topsin-M70	22.7	4.0	73.3	22.0	3.0	75.0	22.4	3.5	74.2
Rizolex-T	29.3	6.0	64.7	26.0	2.0	72.0	27.6	4.0	68.4
Vitavax-70	22.7	4.0	73.3	21.3	4.7	74.0	22.0	4.4	73.7
Vitavax-40	23.3	7.3	69.4	22.7	3.3	74.0	23.0	5.3	71.7
Control	52.7	13.3	34.0	54.7	13.3	32.0	53.7	13.3	33.0
Mean	27.8	6.9	65.4	26.9	4.6	68.5	27.4	5.7	67.0
cv.Giza-89									
Maxim	18.0	4.0	78.0	15.3	2.7	82.0	16.7	3.4	80.0
Topsin-M70	20.7	2.7	76.7	19.3	1.3	79.4	20.0	2.0	78.1
Rizolex-T	22.0	6.7	71.4	26.7	3.7	69.6	24.3	5.2	70.5
Vitavax-70	22.0	4.0	74.0	20.7	4.0	75.3	21.4	4.0	74.7
Vitavax-40	25.3	1.3	73.4	22.0	3.3	74.7	23.7	2.3	74.1
Control	52.7	11.3	36.0	54.7	12.7	32.6	53.7	12.0	34.3
Mean	26.5	5.0	68.5	25.9	4.4	69.7	26.2	4.7	69.1

LSD at 5% for	cv.Giza-86.			cv.Giza-89.		
	Pre.	Post.	Survival.	Pre.	Post.	Survival.
Season2000	4.22	3.97	2.99	3.15	2.29	3.59
Season2001	2.54	2.39	3.08	5.43	2.64	6.11

2- Effect on plant height (cm):

Data in **Table (2)** indicate that treating cotton seeds with fungicides before sowing improved plant height of both cotton cvs., more than the untreated ones. In this respect, Vitavax-T70 followed by Vitavax-T40 and Rizolex-T were the best effective

fungicides in increasing cotton plant height during the two growing seasons (2000-2001) where they resulted in a remarkable increase over other treatments. On the other hand, the other tested fungicides were also more effective than the un-treated control in increasing the plant height of tested cotton plants.

Also, data indicate that the average plant height cv. Giza-86 was higher than those of Giza-89 cultivar in both seasons under the effect of all tested treatments.

Table (2): Effect of some fungicides on plant height (cm) of cotton plants cvs.Giza-86 and Giza-89 during 2000 and 2001 growing seasons

Treatments	Average plant height (cm)					
	Season 2000		Mean	Season 2001		Mean
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Maxim	126.3	124.7	125.5	124.7	123.7	124.2
Topsin-M	128.7	117.7	123.2	128.0	117.7	122.8
Rizolex-T	129.7	124.0	126.8	128.7	123.3	126.0
Vitavax-T70	135.3	133.0	134.1	128.7	129.0	128.8
Vitavax-T40	133.7	129.3	131.5	128.7	127.7	128.2
Control	124.7	117.0	120.8	121.0	115.0	118.0
Mean	129.0	124.3	126.6	126.6	122.8	124.7

LSD at 5% for

	Season 2000	Season 2001
Cotton cultivars = (C)	0.843	0.933
Treatments = (T)	1.690	1.87
C x T	2.386	2.64

3- Effect on fruiting branches of cotton plants:

Data in **Table (3)** show that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the number of fruiting branches on growing plants. In this respect, Vitavax-T70 followed by Vitavax-40 were the best effective fungicides in increasing the number of fruiting branches onto both cvs. Giza-86 and Giza-89 during the growing seasons 2000 and 2001 comparing with some other tested fungicides and untreated control.

4- Effect on bolls number of cotton plants:

Data in **Table (4)** indicate that treating cotton seeds cvs.Giza-86 and Giza-89 with fungicides for controlling root rot pathogens led to increasing the number of opened bolls/plant compared with control treatment (untreated seeds). Meanwhile, the only exception in this respect was Topsin-M70 treatment where it was less effective especially on cv. Giza-86 during season 2000. Also, it is clear that the highest increase in both cotton cvs., was produced by using Vitavax-T70 and Vitavax-T40 respectively during seasons 2000 and 2001.

Table (3): Effect of some fungicides on fruiting branches of cotton plants cvs.Giza-86 and Giza-89 during 2000 and 2001 growing seasons

Treatments	Number of fruiting branches / plant					
	Season 2000		Mean	Season 2001		Mean
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Maxim	12.0	12.3	12.2	11.3	12.0	11.7
Topsin-M70	12.0	11.0	11.5	10.7	10.7	10.7
Rizolex-T	12.3	12.0	12.2	12.3	12.0	12.1
Vitavax-T70	15.3	14.3	14.8	12.7	14.0	13.4
Vitavax-T40	15.0	13.7	14.4	13.0	12.0	12.5
Control	11.3	10.3	10.8	10.7	9..0	9.8
Mean	13.0	12.2	12.6	11.9	11.6	11.7

L.S.D.at 5% for

	Season 2000	Season 2001
Cotton cultivars = (C)	0.464	N.S.
Treatments = (T)	1.690	1.01
C x T	n.s.	n.s.

Table (4): Effect of some fungicides on mature opened bolls of cotton plants cvs.Giza-86 and Giza-89 during 2000 and 2001 growing seasons

Treatments	Number of opened bolls/plant					Mean
	Season 2000		Mean	Season 2001		
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Maxim	18.0	20.3	19.2	16.0	19.3	17.6
Topsin-M70	14.3	20.0	17.2	14.3	19.3	16.8
Rizolex-T	17.3	19.0	18.2	15.3	17.3	16.3
Vitavax-T70	21.3	24.3	22.8	17.0	22.7	19.8
Vitavax-T40	21.3	23.0	22.2	21.3	21.7	21.5
Control	14.7	18.7	16.7	12.7	17.0	14.8
Mean	18.1	21.2	19.6	16.5	19.8	18.2

L.S.D.at 5% for

	Season 2000	Season 2001
Cotton cultivars = (C)	0.68	0.577
Treatments = (T)	1.36	1.154
C x T	n.s,	1.63

5- Effect on the weight of cotton yield:

Data in **Table (5)** indicate that treating cotton seeds cvs.Giza-86 and Giza-89 with fungicides for controlling damping-off pathogens also led to increasing the weight of yielded cotton fibers for each boll. In this respect, Vitavax-T70 and Vitavax-T40 were the best for seed treatment in increasing the weight of yielded cotton for each boll during the two growing seasons for both tested cotton cvs. Giza-86 and Giza-89. Also, treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also cotton yield (g)/plant of growing plants. In this respect, Vitavax-T70 and Vitavax-T40 were the most effective fungicides in increasing the cotton yield (g)/plant for both cvs. Giza-86 and Giza-89 during 2000 and 2001 growing seasons.

It is clear also, that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the yield of cotton (g/plot). In this respect, Vitavax-T70 and Vitavax-T40 were more effective for seed treatment in increasing cotton yield (g/plot) for cv. Giza-86 and cv. Giza-89 during seasons 2000 and 2001.

Table (5): Effect of some fungicides on cotton weight/boll, yield of cotton/plant and cotton yield/plot of cotton plants cvs. Giza-86 and Giza-89 during 2000 and 2001 growing seasons.

Treatments	Season 2000		Mean	Season 2001		Mean
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Cotton weight (g)/boll						
Maxim	2.2	2.3	2.3	2.2	2.3	2.3
Topsin-M70	2.3	2.2	2.7	2.2	2.2	2.2
Rizolex-T	2.2	2.3	2.7	2.2	2.3	2.2
Vitavax-T70	2.4	2.6	2.5	2.2	2.5	2.4
Vitavax-T40	2.4	2.6	2.5	2.3	2.4	2.4
Control	2.2	2.2	2.2	2.1	2.1	2.1
Mean	2.3	2.4	2.5	2.2	2.3	2.3
Yield of cotton (g/ plant						
Maxim	39.0	46.1	42.1	34.5	44.0	39.3
Topsin-M70	32.6	44.7	38.7	31.8	42.7	37.3
Rizolex-T	38.3	43.7	41.0	33.3	39.5	36.4
Vitavax-T70	51.8	64.2	58.0	37.9	57.1	47.5
Vitavax-T40	50.2	58.9	54.5	48.6	52.1	50.4
Control	31.5	41.1	36.3	26.7	36.0	31.4
Mean	40.6	49.8	45.1	35.5	45.2	40.4
Cotton yield (g/plot)						
Maxim	280.7	598.7	439.7	391.7	587.9	489.8
Topsin-M70	348.3	600.8	474.5	348.7	512.8	430.7
Rizolex-T	484.8	704.1	594.5	379.3	580.5	479.9
Vitavax-T70	793.6	1004.7	899.2	518.2	834.3	676.3
Vitavax-T40	719.7	942.6	831.2	671.8	781.7	726.7
Control	302.3	451.1	376.7	239.2	386.6	312.9
Mean	488.2	717.0	602.6	424.8	613.9	519.3

LSD at 5% for	Cotton cultivar = (C)		Treatments = T		Cx T	
	2000	2001	2000	2001	2000	2001
Cotton weight (g)/boll	0.051	0.023	1..36	0.046	n. s.	0.066
Yield of cotton (gram) / plant	5.534	4.974	1.374	2.689	n. s.	3.803
Cotton yield (g/plot).	53.8	31.4	70.7	26.9	100.0	88.9

6- Effect on the yield of cotton lint:

Data in **Table (6)** indicate that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens led to increasing the average yield of cotton lint (g)/plant compared with the control treatment (untreated seeds). The only exception in this respect was Topsin-M treatment which was less effective for both cvs. Giza-86 and Giza-89 during the two growing seasons 2000 and 2001 comparing with the other tested fungicides. Also, it is clear that the highest increase for both cotton cvs. was produced by using Vitavax-T70 and Vitavax-T40 during seasons 2000 and 2001.

Data in **Table (6)** show also, that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the yield of cotton lint (g/plot). In this respect, treating seeds with each of Vitavax-T70 or Vitavax-T40 were the more effective in increasing the yield of cotton lint (g/plot) for cv. Giza-86 and cv. Giza-89 during season 2000. On the other hand, Topsin-M and Vitavax-70 showed the best effect in increasing the yield of cotton lint of cv. Giza-86 during season 2001. Meanwhile, Vitavax-T70 followed by Vitavax-T40 was the more effective fungicides in increasing the yield of cotton lint of cv. Giza-89 during the same season.

Table (6): Effect of some fungicides on the yield of cotton lint (g)/plant and yield of cotton lint (g/plot) for cotton plants cvs.Giza-86 and Giza-89. during 2000 and 2001 growing seasons.

Treatments	Season 2000		Mean	Season 2001		Mean
	Giza-86	Giza-89		Giza-86	Giza-89	
Yield of cotton lint (g)/plant						
Maxim	12.9	15.4	14.2	11.8	14.7	13.3
Topsin-M70	10.8	14.8	12.8	10.6	14.2	12.4
Rizolex-T	12.8	14.6	13.7	11.1	13.2	12.2
Vitavax-T70	17.2	21.4	19.3	12.6	19.0	15.8
Vitavax-T40	16.7	19.6	18.2	16.0	17.3	16.6
Control	10.5	13.7	12.1	8.9	12.0	10.5
Mean	13.6	16.8	15.2	12.2	15.3	13.7
Yield of cotton lint (g/plot)						
Maxim	141.6	196.1	168.8	153.2	199.2	176.2
Topsin-M70	113.2	198.8	156.0	125.2	175.7	150.4
Rizolex-T	161.3	235.6	198.5	132.7	200.7	166.7
Vitavax-T70	260.8	343.5	302.2	175.3	283.1	229.2
Vitavax-T40	236.6	313.1	274.8	230.6	264.5	247.5
Control	100.1	142.8	121.4	81.5	133.4	107.4
Mean	168.9	238.3	203.6	149.7	209.4	179.5

LSD at 5% for	Cotton cultivar (C)		Treatments (T)		C x T	
	2000	2001	2000	2001	2000	2001
Yield of cotton lint	1.8	1.682	N.S.	0.8779	N.S.	1.241
Yield of cotton lint	11.5	9.8	22.9	19.7	32.5	27.8

7- Effect on the yield of cotton seeds (g)/plant and yield of cotton seeds (kg/feddan):

Data in **Table (7)** show that treating cotton seeds cvs.Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the yield of cotton seeds (g)/plant. In this respect, Vitavax-T70 followed by Vitavax-T40 was the best treatments during season 2000 on both tested cotton cvs. Giza-86 and Giza-89. While, Vitavax-T40 was the best seed treatment during season 2001 in increasing the yield of cotton seeds of cv. Giza-86. Vitavax-T70 followed by Vitavax-T40 were the best seed treatments for cv Giza-89 during the same season.

Data indicate also, that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the yield of cotton seeds

(g/plot). In this respect, using the tested fungicides resulted in noticeable increase in yield of cotton seeds for both cotton cvs. Giza-86 and Giza-89 during the two growing seasons comparing with the un-treated control. Moreover, Vitavax-T70 and Vitavax-T40 were the most effective seed treatments for both tested cotton cvs during season 2000. On the other hand, Vitavax-T40 followed by Vitavax-T70 showed the best effect for cv. Giza-86 during season 2001 while, Vitavax-T70 and Vitavax-T40 were the most effective seed treatments for cv. Giza-89 during the same season.

Table (7): Effect of some fungicides on the yield of cotton seeds (g)/plant and yield of cotton seeds (g/plot) of cotton cvs. Giza-86 and Giza-89 during 2000 and 2001 growing seasons.

Treatments	Season 2000		Mean	Season 2001		Mean
	Giza-86	Giza-89		Giza-86	Giza-89	
Yield of cotton seeds (g) / plant						
Maxim	26.0	30.7	28.4	22.7	29.3	26.0
Topsin-M70	21.7	29.6	25.7	21.2	28.5	24.8
Rizolex-T	25.5	29.1	27.3	22.2	26.2	24.2
Vitavax-T70	34.6	42.8	38.7	25.3	38.0	31.7
Vitavax-T40	33.5	39.3	36.4	31.9	34.7	33.3
Control	20.9	27.4	24.2	17.8	24.0	20.9
Mean	27.3	33.6	30.4	24.2	30.5	27.3
Yield of cotton seeds (g/plot)						
Maxim	287.0	402.6	344.8	256.6	388.7	322.6
Topsin-M70	235.2	401.2	318.2	223.6	336.4	281.8
Rizolex-T	323.6	468.4	396.0	246.6	379.7	313.2
Vitavax-T70	532.7	702.2	617.5	342.8	551.6	447.2
Vitavax-T40	438.2	629.4	533.8	441.2	517.2	479.2
Control	202.2	229.3	215.7	157.7	253.2	205.5
Mean	336.5	472.2	404.3	278.1	404.5	341.6

LSD at 5% for	Cotton cultivar = (C)		Treatments = T		Cx T	
	2000	2001	2000	2001	2000	2001
Yield of cotton seeds (g) / plant	3.735	3.241	2.703	1.835	N.S.	2.595
Yield of cotton seeds (g/plot)	24.4	31.7	48.7	63.4	68.8	N.S.

8- Effect on the fiber length:

Data in **Table (8)** reveal that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens improved also the fiber length of yielded cotton. In this respect, the tested fungicides improved clearly the fiber length of yielded cotton for both cotton cvs. Giza-86 and Giza-89 during the two growing seasons comparing to un-treated seeds (control). Therefore, Vitavax-T70 followed by Vitavax-T40 were the most effective seed treatments in increasing the fiber length of the yielded cotton of the two cotton cvs during seasons 2000 and 2001.

9- Effect on the fiber strength:

Data in **Table (9)** reveal that treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens improved also the fiber strength of the yielded cotton. In this respect, most the determined values of fiber strength (micron) were clearly different from those of the un-treated one (control). Vitavax-T70, Vitavax-T40 gave the best effect in improving the fiber strength of the yielded cotton over the other tested fungicides during the two growing, i.e., seasons 2000 and 2001.

Table (8): Effect of some fungicides on the fiber length (mm) of cotton cvs.Giza-86 and Giza-89.during 2000 and 2001 growing seasons.

Treatments	Fiber length (mm)					
	Season 2000		Mean	Season 2000		Mean
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Maxim	31.7	32.1	31.9	31.6	32.2	31.9
Topsin-M	31.9	31.9	31.9	31.9	31.8	31.8
Rizolex-T	33.0	32.1	32.6	33.0	32.4	32.7
Vitavax-T70	33.9	33.2	33.6	33.7	33.1	33.4
Vitavax-T40	33.4	32.8	33.1	33.3	32.8	33.0
Control	31.2	31.5	31.4	31.2	31.4	31.3
Mean	32.7	32.2	32.5	32.6	32.2	32.4

L.S.D.at 5% for

	Season 2000	Season 2001
Cotton cultivar = (C)	0.304	0.294
Treatments = T	0.61	0.588
Cx T	n. s.	n. s.

Table (9): Effect of some fungicides on the fiber strength of cotton cvs. Giza-86 and Giza-89. during 2000 and 2001 growing seasons.

Treatments	Fiber strength (micron)					
	Season 2000		Mean	Season 2000		Mean
	cv.Giza-86	cv.Giza-89		cv.Giza-86	cv.Giza-89	
Maxim	17.9	17..9	17.9	17.8	17.9	17.8
Topsin-M	17.9	18..1	18.0	17.8	18.1	17.9
Rizolex-T	18.2	17..9	18.0	18.2	17.8	18.0
Vitavax-T70	18.8	18..3	18.6	18.6	18.2	18.4
Vitavax-T40	18.7	18..2	18.5	18.4	18.2	18.3
Control	17.6	17..6	17.6	17.5	17.7	17.6
Mean	18.2	18.0	18.1	18.1	17.9	18.0

L.S.D.at 5% for

	Season 2000	Season 2001
Cotton cultivar = (C)	0.110	0.108
Treatments = T	0.213	0.216
Cx T	0.302	0.306

DISCUSSION

Cotton seedling diseases whether pre or post emergence are world wide problem, often causing serious stand losses. A number of soil and seed borne pathogens can infect cotton seedlings individually or in association as a disease complex. Cotton plants are subjected to attack by various pathogenic fungi causing several diseases during different stages of growth. Among these diseases are the seed rot and seedling damping-off. A number of pathogenic fungi including seed-borne and soil-borne pathogens such as *Alternaria* spp, *Fusarium* spp., *Rhizopus* spp. and *Aspergillus* spp. are the most frequently identified seed borne pathogens in cotton (**Minton and Garber 1983**).

Treating cotton seeds with fungicides before sowing affected positively damping-off incidence under field conditions. Maxim was the most effective fungicide in reducing disease incidence of cotton plants cvs. Giza-86 and Giza-89 during the both growing seasons (2000/01). Also, treating cotton seeds with fungicides before sowing improved plant height of both cotton cvs. more than the untreated ones. Vitavax-T70 followed by Vitavax-T40 and Rizolex-T were the best effective fungicides in increasing cotton plant height during the two growing seasons (2000/01). On the other hand, the other tested fungicides were more effective than the un-treated control in increasing the plant height of tested cotton plants. Meanwhile, treating cotton seeds with fungicides increased the number of fruiting branches on growing plants. Vitavax-T70 followed by Vitavax-40 were the best effective fungicides in increasing the number of fruiting branches onto both cvs. Giza-86 and Giza-89 during the growing seasons 2000 /01 comparing with some other tested fungicides and untreated control. It is clear also that treating cotton seeds with fungicides before sowing increased the number of opened bolls/plant compared with control treatment (untreated seeds) with superiority of Vitavax-T70 and Vitavax-T40 respectively during seasons 2000 and 2001. Moreover, treating cotton seeds with fungicides before sowing increased the weight of yielded cotton fibers for each boll. Vitavax-T70 and Vitavax-T40 were the best seed treatments in increasing the weight of yielded cotton for each boll during the two growing seasons for both tested cotton cvs. Giza-86 and Giza-89. Also, Vitavax-T70 and Vitavax-40 were the most effective fungicides in increasing the cotton yield (g)/plant for both cvs. during the same seasons. In addition, treating cotton seeds with fungicides for controlling root rot pathogens increased also the yield of cotton (g/plot) where, Vitavax-T70 and Vitavax-T40 were the most effective seed treatments in this respect of both cotton cvs. during seasons 2000/01. Treating cotton seeds with the fungicides increased also the yield of cotton lint (g)/plant and the yield of cotton lint (g/plot) compared with the control treatment (untreated seeds) with superiority of Vitavax-T70 and Vitavax-T40 on both cotton cvs during seasons 2000 and 2001. Treating cotton seeds cvs. Giza-86 and Giza-89 with fungicides for controlling root rot pathogens increased also the yield of cotton seeds (g)/plant and the yield of cotton seeds (g/plot). Vitavax-T70 and Vitavax-T40 were the best treatments during the two seasons on both tested cotton cvs. Giza-86 and Giza-89. Also, treating cotton seeds with fungicides for controlling root rot pathogens improved also the fiber length of yielded cotton. Therefore, Vitavax-T70 followed by Vitavax-T40 were the most effective seed treatments in increasing the fiber length and the fiber strength of the yielded cotton of the two cotton cvs during seasons 2000 and 2001. The obtained results could be interpreting in light the findings of **Abdel-Shahaid et al. (1989)**, who reported that the

fungicide Benlate (benomyl) 50% as a soil treatment in the greenhouse protected effectively cotton seedlings against *R. solani* and *Fusarium solani* at concentrations as low as 20 ppm. Also, **Youssef et al. (1995)** **Helal et al. (1997)** and **El-Safety et al. (2001)** confirmed that treating cotton seeds with fungicides, *i.e.*, Monceren, Rizolex, Vitavax 300 and others before planting in infested and non infested soil in the greenhouse gave the highest seedling emergence and the highest percentage of survived seedlings as well as improving seedling vigor at the two stages of seedling growth in the greenhouse. Similar results were obtained also by **EL-Deeb et al. (2002)** who demonstrated that the fungicides, Vitavax-T, Rizolex-T and Topsin-M70 increased many of growth characters and pod yield of peanut compared to the non-treated. Moreover, **Goulart (2002)** found in greenhouse studies, that dressing seeds of cotton with fungicides controlled damping-off caused by *R. solani*.

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كفاءة معاملة تقاوى القطن بالمبيدات فى مقاومة مسببات أمراض الجذر

1- تأثير معاملة التقاوى ببعض المبيدات الفطرية على حدوث موت البادرات والمكونات المحصولية للقطن وجودة الألياف تحت ظروف الحقل

نوال عبد المنعم عيسى* ، جهاد محمد الهباء ، محمود إبراهيم العميرى** ، السيد عبد الرحيم حسن**

* قسم النبات الزراعى – كلية الزراعة بمشتهر – جامعة بنها

** معهد بحوث المحاصيل الحقلية- مركز البحوث الزراعية – جيزة

أدت معاملة تقاوى القطن بالمبيدات الفطرية قبل الزراعة فى الحقل إلى تخفيض حدوث موت البادرات، وكانت المبيدات ماكسيم وتوبسين-م متبوعة بمبيد فيتافاكس-ت70 هى الأكثر فاعلية فى تخفيض نسبة موت البادرات لنباتات القطن صنفى جيزة-86 وجيزة-89 خلال موسمى النمو 2000/2001. وفى الوقت الذى أدت معاملة تقاوى القطن بالمبيدات الفطرية قبل الزراعة إلى مقاومة أعفان الجذور زودت أيضا من طول النبات وعدد الفروع المثمرة وعدد اللوزات المتفتحة على النبات ووزن محصول القطن للوزة الواحدة ومحصول القطن للنبات ومتوسط محصول القطن الشعر للنبات ومحصول البذور للنبات ومحصول القطن الكلى للفدان ومحصول القطن الشعر للفدان ومحصول البذور الكلى للفدان بالإضافة إلى طول الليفة وقوتها لكل من صنفى القطن جيزة-86 وجيزة-89 خلال موسمى النمو 2000/2001. وبشكل عام كانت المبيدات فيتافاكس-ت70 وفيتافاكس-ت40 هى الأفضل لمعاملة تقاوى القطن تحت ظروف الحقل مقارنة بباقى المبيدات المختبرة مثل ماكسيم وتوبسين-م وريزولكس-ت وغير المعامل فى هذا الشأن.