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THE EFFECT OF PROTECTED TOMATO SEEDLING ON THE GROWTH AND YIELD OF LATE SUMMER TOMATO IN EGYPT

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Abstract: The main factor of decreasing the total yield of late summer season of the tomato crop in Egypt, is the common infection by TYLCV, in spite of the intensive use of pesticides. This study was carried out in Balteem district during late summer season of 1994 and 1995. Three tolerant hybrid tomato varieties were used. The seedlings of each variety were in two groups - according to the source of nursery-protected- and non-protected ones. Data indicated that the use of protected tomato seedlings improved the growth characters-plant height, number of leaves, branches and flower buds per plant. The TYLCV infection ratio decreased from 35% in non-protected seedlings to 20% in protected ones. The total yield was higher by about 58-92% than non-protected seedlings.

INTRODUCTION

Tomato production is the main vegetable crop in Egypt. The cultivated area was more than 161 thousand ha in 1990/1991. One third of this area was cultivated during late summer season, as one of the main tomato cultivation season in Egypt.

Since about ten years ago the area of this season was decreased due to the dramatically of reduction in the average total yield. The main factor of decreasing the yield, is the common infection by TYLCV, in spite of the intensive use of pesticides. The infection was more serious when the growers used infected seedling. Which resulted in 100% virus infection (unpublished data) under open field conditions, with common varieties.

The seedling production system is one of the main factors affected the open field tomato production. Many researches were done, aiming to produce standard seedling (El-Aidy, 1993 and 1995, Abd El-Rahman and El-Aidy 1993, Meinick, 1996 and Vavrina, 1996). These studies indicated the superiority of using seedling trays system and the importance of protection nursery against unfavorable conditions. In spite the clearance of the protected nurseries, the total area of the protected nurseries in Egypt is still very small, about 4% only from the total covered area (Abou-Hadid et al. 1995).

The objective of this study is to evaluate the effect of protected seedlings and the use of some tolerant tomato cvs. on growth and yield of late summer tomato under the conditions of North Delta of Egypt.

MATERIALS AND METHODS

The experiments were carried out in Balteem District during late summer seasons of 1994 and 1995. Three tolerant hybrid tomato cvs. and protected and nonprotected seedlings were used as the following treatments :

- 1- CL 150 protected seedling (CL 150 P)
- 2- CL 150 nonprotected seedling (CL 150 NP)
- 3- TY 84 protected seedling (TY 84 P)
- 4- TY 84 nonprotected seedling (TY 84 NP)
- 5- 8001 protected seedling (8001 P)
- 6- 8001 nonprotected seedling (8001 NP)

Transplants were produced in the nursery of the Faculty of Agriculture, Kafr El-Sheikh in two groups: one group was protected against the white fly in protected nursery and the second one was in open nursery. All seedlings were cultivated on 15 August in foam trays and transplanted on 20 Sept. in open field in both years.

The plot size was 175 m². The cultural practices and pest control were done as required. The 6 treatments were randomly distributed in 3 replications. Data were tested by analysis of variance. Duncan's multiple range test was used for comparisons among the means of treatments (Duncan, 1965).

The following data were recorded: no. of leaves/plant, no. of branches/plant, no. of flower buds/plant, TYLCV infection % and total yield.

RESULTS AND DISCUSSION

Data presented in Table (1) indicated that the highest no. of leaves/plant, were obtained from protected 8001 cv. seedlings in both years, followed by TY 84 and CL 150, the data were significant.

Data presented in Table (2) indicated that the highest no. of branches/plant was obtained from the cv. 8001 plants in first season, while the cv. TY 84 produced the highest no. of branches at 55 and 70 days after transplanting in second season, ail data were significant.

Table 1. Effect of Tomato seedling protection and cvs. On no of leaves/plant

Variety	Days after transplanting					
	Protected seedling			Non Protected seedling		
	40	55	70	40	55	70
1994						
8001	14.0 a	24.4 a	41.2 a	11.0 a	21.0 a	34.3 a
Ty 84	11.0 b	17.3 b	30.5 b	7.6 b	13.6 b	26.3 b
CL 150	6.8 b	16.5 b	19.5 c	4.3 c	11.3 c	14.6 c
LSD 5%		4.447			1.190	
1%		6.093			1.630	
1995						
8001	27.6 a	37.6 a	40.9 a	22.6 a	33.0 a	35.0 a
Ty 84	27.6 a	32.7 b	35.7 b	21.3 b	27.3 b	31.3 b
CL 150	18.9 b	30.4 b	32.7 b	14.6 c	22.6 c	26.3 c
LSD 5%		3.216			1.320	
1%		4.407			1.810	

Table 2. Effect of Tomato seedling protection and cvs. On no of branches/plant

Variety	Days after transplanting					
	Protected seedling			Non Protected seedling		
	40	55	70	40	55	70
1994						
8001	8.6 a	9.3 a	12.0 a	5.6 a	7.3 a	9.3 a
Ty 84	7.2 ab	8.3 a	9.7 ab	4.3 b	6.3 b	7.6 b
CL 150	4.6 b	7.0 a	8.0 b	2.6 c	4.67 c	6.3 c
LSD 5%		2.797			0.990	
1%		3.832			1.360	
1995						
8001	9.6 a	13.0 b	15.1 ab	6.6 a	10.3 b	12.3 b
Ty 84	9.3 a	15.3 a	17.2 a	6.6 a	12.3 a	14.3 a
CL 150	6.8 b	12.1 b	13.2 b	5.3 b	9.3 c	10.3 c
LSD 5%		2.298			0.990	
1%		3.148			1.360	

In column, means followed by a common letter are not significantly different at the 5% level by DMRT.

The trend of no of flower buds/plant was the same as the trend of no. of leaves/plant. The cultivar 8001 produced the highest no of flower buds/plant in both years as shown in Table (3).

Table 3. Effect of Tomato seedling protection and cvs. On no on flower buds/plant

Variety	Days after transplanting					
	Protected seedling			Non Protected seedling		
	40	55	70	40	55	70
1994						
8001	6.6 a	14.0 a	21.0 a	3.6 a	9.3 a	14.6 a
Ty 84	4.2 ab	8.0 b	14.7 b	2.6 b	6.0 b	11.3 b
CL 150	2.2 b	6.3 b	7.7 c	1.3 c	3.6 c	5.3 c
LSD 5%	3.062			0.930		
1%	4.195			1.280		
1995						
8001	14.3 a	18.8 a	21.4 a	7.6 a	11.6 a	16.0 a
Ty 84	14.9 a	18.2 a	20.5 a	8.0 a	11.3 a	15.3 b
CL 150	10.9 b	16.3 a	17.6 b	6.3 b	10.3 a	14.3 b
LSD 5%	2.427			1.32		
1%	3.326			1.81		

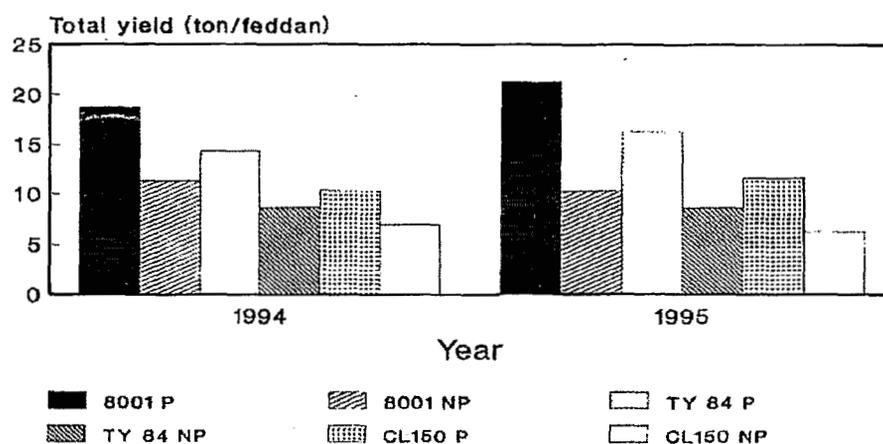
In column, means followed by a common letter are not significantly different at the 5% level by DMRT

The data in Table (4) and Fig. (1) show that the highest average total yield was obtained from the cv. 8001, followed by TY 84 and CL 150 in both seasons and all data were significant. The best results were obtained from cultivar 8001 when used the protected seedling.

Table 4. Effect of tomato seedling protection and cvs. On TYLCV infection ration (%)

Variety	Protected seedling		Nonprotected seedling	
	1994	1995	1994	1995
8001	18.67 a	21.33 a	11.33 a	10.33 a
Ty 84	14.33 b	16.33 b	8.67 b	8.67 b
CL 150	10.33 c	11.67 c	7.00 b	6.33 c
LSD 5%	1.63	1.15	1.88	1.15
1%	2.47	1.75	2.85	1.75

In column, means followed by a common letter are not significantly different at the 5% level by DMRT



Balteam 1994 and 1995
Faddan = 4200 m²

Figure 1. Effect of tomato seedling protection and cvs. On total yield

The effect of seedling protection against the white fly was more affected than that between the cultivars. The difference of the average of the two seasons between protected and nonprotected seedling was 9.17 ton/faddan in the cv. 8001 while this difference was only 2.16 ton/faddan between the cultivars 8001 and TY 84 under the case of nonprotected seedlings.

The previous data can explained by observing date presented in Table (5) and Fig. (2 &3). The TYLCV infection ratio was low among the protected seedling, the best results were in 1995 followed by 1994 from the cultivar 8001, while the rest average yield results were followed the ratio of virus infection.

Table 5. Effect of tomato seedling protection and cvs. On TYLCV infection ration (%)

Variety	Days after transplanting					
	Protected seedling			Non Protected seedling		
	21	42	63	21	42	63
1994						
8001	5	11	15	10	18	25
Ty 84	8	15	18	12	19	27
CL 150	13	17	20	17	25	30
1995						
8001	4	5	6	7	12	17
Ty 84	2	8	12	5	11	19
CL 150	10	15	19	13	19	27

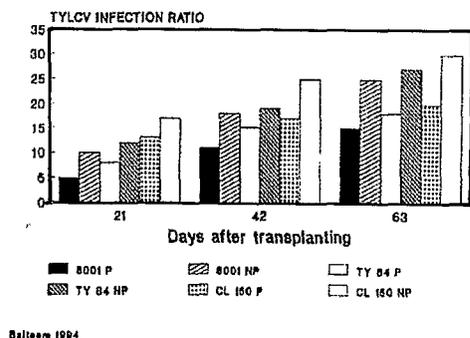


Figure. 2 Effect of tomato seedling protection cvs on TYLCV infection % Balteem 1994

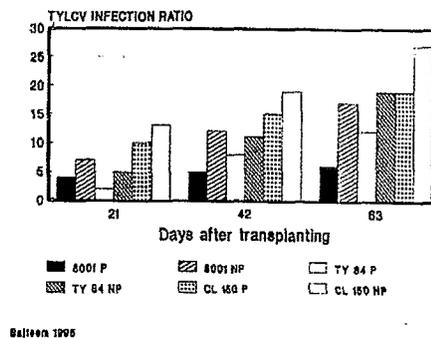


Figure. 3 Effect of tomato seedling protection on TYLCV infection % Balteem 1995

CONCLUSION

These data indicate that the use of new tolerant tomato cvs combined with completely protection from the white fly during the nursery period can result in an economic yield of tomato under the open field conditions during late summer season without any need to excess use of pesticides.

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