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EFFECT OF NETTING ON VIRUS DISEASE AND YIELD OF SUMMER TOMATO

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ABSTRACT

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The study was carried out in the field of Olericulture Division, Horticulture Research Centre, Bangladesh Agricultural Research Institute, Joydebpur. Two summer tomato hybrids were tested against net and open field condition during summer season of 2011. Net protection had significant influence on summer tomato production. Plants grown under net protection condition produced significantly higher number of fruits per plant (26.78) compared to that of open field condition (21.13). Fruit yield per plant was also higher in net protected plants (1.22 kg) and only 0.85 kg per plant when grown under open condition. Plants grown in open field were more than 40% plants were infected with TYLCV in open field while it was only 1.5% in net protected condition.

Kew words: *summer tomato, netting, virus and yield*

INTRODUCTION

Growing tomato (*Solanum lycopersicum*) during summer in Bangladesh is very popular. National average yield of tomato is 6.6 ton/ha (Anon. 2010). It is very low compared to other countries. This low yield of tomato due to lack of good variety and pest and disease problem. It is reported that hybrid or HYV variety of tomato resulted in increased yield of 20 to 50% (Chowdhury *et al.* 1965; Tesi *et al.* 1970). It likes cool and dry weather for better growth and development (Rashid 1999). Tomato production during summer season is restricted due to presence of high temperature, high humidity and rainfall. Adverse climatic condition during summer causes severe flower dropping in tomato (Picken 1984). Its production is largely affected by the infection tomato yellow leaf curl virus. Yield loss may attain up to hundred per cent due to severe attack of virus. White fly is the major carrier of the virus disease. Control of white fly is the prime option to prevent the crop from the YLCV. Other potential ways to protect the crop from TYLCV are the use of resistant variety, spraying insecticide to control vector, protected cultivation etc. Production of tomato seedling as well tomato crop under net protected condition may be of useful to produce healthy tomato plants. Therefore, the present study was undertaken to observe the effect of net protection on summer tomato production.

MATERIALS AND METHODS

The experiment was conducted at the experimental field of Olericulture Division, HRC, BARI, Gazipur during the summer season of 2011. The experiment was conducted in RCB design in which two tomato varieties were grown in open and net protected condition. The seeds of BARI hybrid tomato-3 and BARI hybrid tomato-4 were sown in two separate seed bed on May 30, 2011. One seedbed was covered with nylon net while other seed bed remained open. Seedlings were transplanted in the main field on June 29, 2011. Under net protection condition the whole bed was covered with white nylon net (60 mesh) to protect the crop from white fly infestation. The unit plot size was 3.6m x 2.3m accommodating 24 plants in each plot having 60 cm x 40 cm plant spacing. The crop was fertilized with cow dung 10 ton, urea 550kg, TSP 450kg and MP 250kg per ha, respectively. Half of the quantity of cowdung, entire TSP and half of the MP were applied during land preparation. The remaining half of the cowdung was applied during pit preparation. The rest of MP and entire urea were applied in three equal installments at 15, 30 and 45 days after transplanting. Irrigation, pruning, mulching weeding and other intercultural operations were done as and when necessary. No insecticidal spray was made in the present study. Data were recorded for some yield and yield contributing characters. Per plant yield was converted from plot yield. The recorded data under the present study were statistically analyzed using MSTAT programme. The level of significance and analysis of variance along with the Duncans Multiple Range Test (DMRT) Test were done following Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Effect of variety on yield and virus infection was present in Table 1. Virus infection was gradually increased with the advancement of cropping period for both of the varieties. The variety BARI Hybrid Tomato 4 had larger fruit (43.40 g) than that of BARI Hybrid Tomato 3 (38.83 g). Variety BARI Hybrid Tomato 4 showed higher TSS (4.01%) than variety BARI Hybrid Tomato 3 (3.81%).

Table 1. Effect of variety on summer tomato production

Variety	Days to first flower	No. of fruits/plant	Individual fruit wt (g)	Fruit yield/plant (kg)	TSS (%)	Virus infestation (%)			
						45 DAS	60 DAS	75 DAS	90 DAS
BARI Hybrid Tomato 4	45.16	23.28	43.40	1.02	4.01	4.5	8.5	19.5	34.0
BARI Hybrid Tomato 3	45.33	24.83	38.83	0.94	3.81	3.5	10	24.5	37.0
F-test	NA	Ns	*	Ns	ns	NA	NA	NA	NA
CV (%)	-	9.03	6.15	9.81	10.0	-	-	-	-

NA: Not analyzed

Nylon net protection had significance influence on summer hybrid tomato production. Plants grown under net protection condition produced significantly higher number of fruits per plant (26.78) compared to that of open field condition (21.13). Corresponding fruit yield per plant was also higher in plants grown under net (1.22 kg) while it was only 0.85 kg per plant when grown under open condition. This variation might be attributed due to severe infection of plants by TYLCV in open field condition. Fijnmil and Fajinmil (2010) found similar results on okra. Table 2 revealed that plants grown in open field were badly affected by TYLCV. More than 40% plants were infected with TYLCV in open field while it was only 1.5% in net protected condition. Total soluble solid (TSS) of summer tomato collected from net protected field (4.11%) also significantly higher than those produced from open field condition (3.71%).

Table 2. Effect of net protection on summer hybrid tomato production

Treatment	Days to first flower	No. of fruits/plant	Individual fruit wt (g)	Fruit yield/plant (kg)	TSS (%)	Virus infestation (%)			
						45DAS	60DAS	75 DAS	90 DAS
With net	45.33	26.78	43.00	1.22	4.11	0.0	1.5	1.5	13.0
Without net	45.16	21.13	39.33	0.85	3.71	8.0	17.0	42.5	58.0
F-test	ns	**	*	**	*	NA	NA	NA	NA
CV (%)	4.43	9.03	6.15	9.81	10.0	-	-	-	-

NA: Not analyzed

Interaction effect between variety and net protection was not significant (Table 3). However, both the varieties performed better under net protected condition. The variety BARI Hybrid Tomato 4 under net protection showed maximum yield (1.15 kg/plant) and the variety BARI Hybrid Tomato 3 without net showed the lowest yield (0.79 kg/plant).

Table 3. Interaction effect of variety and net protection on summer tomato production

Variety X Treatment	Days to first flower	No. of fruits/plant	Individual fruit wt (g)	Fruit yield/plant (kg)	TSS (%)	Virus infestation (%)			
						45 DAS	60 DAS	75 DAS	90 DAS
V1 X T1	44.66	25.23	45.66	1.15	4.22	0.0	0.0	0.0	12.0
V1 X T2	45.66	21.33	41.33	0.90	3.80	9.0	17.0	39.0	56.0
V2 X T1	46.00	28.33	40.33	1.09	4.00	0.0	3.0	3.0	14.0
V2 X T2	44.66	21.33	37.33	0.79	3.63	7.0	17.0	46.0	60.0
F-test	ns	ns	ns	ns	Ns	NA	NA	NA	NA
CV (%)	4.43	9.03	6.15	9.81	10.0	-	-	-	-

V1= BARI Hybrid Tomato 4, V2=BARI Hybrid Tomato 3, T1=With net and T2= Without net

NA: Not analyzed

CONCLUSION

Plants grown under net protection condition produced significantly higher number of fruits per plant (26.78) compared to that of open field condition (21.13). Fruit yield per plant was also higher in net protection plants (1.22 kg) and only 0.85 kg per plant when grown under open condition. Virus infection was also less in net protected field.

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