Veg. Sci. 37(1) : 94-96 (2010)

Short Communication

RESPONSE OF VARIETIES AND TRANSPLANTING DATES ON SEED YIELD AND QUALITY OF TOMATO

RAMESHWAR SINGH, PM SINGH AND S GUPTA

Indian Institute of Vegetable Research, Varanasi

Tomato (*Lycopersicon esculentum* Mill) is one of the major commercial fruit vegetables of north India. Due to lack of adequate knowledge of seed production practices, the growers are unable to produce quality seed of newly developed varieties. In tomato, pollination and fruit set are highly affected by temperature, thus at low and high temperatures the fruit and seed yields are reduced. It indicates that transplanting date directly affects the seed yield and quality. Hence, the present study was undertaken to identify the optimum planting date for seed production of newly developed tomato varieties.

The present trial was carried out during 2006-2007 at the research farm of IIVR, Varanasi. The seeds were sown in nursery three weeks before transplanting. The seedlings were transplanted at 60 x 45 cm spacing in plots of 2.40 x 2.25m size. There were twenty plants in each plot of a treatment replicated thrice. Three newly released varieties viz., Kashi Vishesh (V_1), Kashi Anupam (V_2), Kashi Amrit (V_3) and one already established variety Hisar Arun (V_4) were transplanted at six dates from 25 August to 8 November at 15 days interval *viz*. 25th Aug (T_1), 9th September (T_2), 24th September (T_3), 9th October (T_4), 24th October (T_5) and 8th November (T_6) using factorial RBD. There were 24 treatment combinations. The recommended doses of P_2O_5, K_2O and half of nitrogen were applied before planting as basal. The remaining half dose of nitrogen was applied at 30 days after transplanting.

The observations were recorded from five randomly selected plants in each plot. Plant height was measured with the help of meter scale. The number of branches per plant, fruits per plant, fruit weight and seed recovery were recorded at harvesting stage. For seed recovery, 5 kg fruits were fermented, seeds extracted and washed. After drying of seeds, the recovery per cent was calculated. The 1000 seeds were counted with the help of a seed counter (Tripette & Renaud, France) and the test weight (g) was measured with the help of an electronic balance (Mettler-Toledo, Switzerland). The seed yield (q/ha) was calculated on the basis of plot yield. . For germination test, four replications of 50 seeds each were placed on two layers of grade B Zerohaze blotter paper (M/s s.d. Fine-chem. Ltd., Mumbai) moistened with water equivalent to 2.5 times substratum weight and germinated on Petri

Table 1. Effect of varieties on different parameters

Varieties	Plant height	No. of branches per plant	No. of fruit per plant	10 fruit weight (kg)	Seed recovery (%)	Test weight (g)	Fruit yield (q/ha)	Germination (%)	Seed yield (q/ha)
V1	68.97	5.16	32.67	0.507	0.42	2.33	177.33	80.01	0.84
V2	58.71	4.84	27.44	0.578	0.45	2.55	173.45	82.32	0.89
V3	64.62	4.48	31.17	0.578	0.40	2.31	193.69	81.41	0.81
V4	72.55	4.54	33.04	0.500	0.42	2.25	191.57	77.19	0.90
CD at 5%	3.5	0.48	2.49	0.278	0.24	0.12	15.78	3.84	0.97

Table 2. Effect of transplanting dates on different parameters

Transplanting dates	Plant height	No. of branches per plant	No. of fruit per plant	10 fruit weight (kg)	Seed recovery (%)	Test weight (g)	Fruit yield (q/ha)	Germination (%)	Seed yield (q/ha)
T1	72.47	4.89	29.03	0.572	0.51	2.76	178.14	91.18	0.878
T2	71.77	5.01	32.51	0.562	0.52	2.82	189.31	90.17	0.985
T3	75.12	4.84	37.21	0.629	0.48	2.57	240.05	90.08	1.14
T4	83.29	4.78	37.46	0.667	0.47	2.48	276.85	89.83	1.37
T5	53.29	4.93	30.05	0.461	0.34	1.93	145.01	64.84	0.54
T6	41.33	4.16	20.23	0.353	0.25	1.59	74.70	55.29	0.25
CD at 5%	4.29	0.59	3.04	0.340	0.29	0.15	19.32	4.71	0.12

Table 3. Interaction effect of varieties and transplanting dates (VxT) on different parameters

Vrs x TDS	Plant height (cm)	No. of branches/ plant	No. of fruit/ plant	10 fruit weight (kg)	Seed recovery (%)	Test weight (g)	Fruit yield (q/ha)	Germination (%)	Seed yield (q/ha)
V1T1	76.63	5.17	25.57	0.507	0.50	2.62	132.10	92.47	0.64
V1T2	67.87	5.93	30.95	0.497	0.52	2.93	183.33	89.87	0.95
V1T3	76.67	5.77	40.60	0.583	0.45	2.63	235.87	90.00	1.12
V1T4	83.33	4.97	42.83	0.673	0.46	2.50	290.10	93.43	1.50
V1T5	67.83	4.90	37.90	0.410	0.35	1.78	152.30	63.23	0.55
V1T6	41.50	4.20	18.20	0.370	0.24	1.50	70.27	51.10	0.25
V2T1	60.40	5.10	23.07	0.653	0.52	2.90	143.00	93.47	0.75
V2T2	64.93	4.73	30.37	0.636	0.54	3.20	189.57	91.57	1.07
V2T3	66.67	5.33	37.37	0.673	0.50	2.67	260.43	89.59	1.27
V2T4	76.73	4.93	33.87	0.730	0.48	2.50	278.37	92.80	1.47
V2T5	44.20	4.97	21.73	0.430	0.39	2.43	110.40	71.90	0.51
V2T6	39.33	4.27	18.27	0.343	0.29	1.59	58.97	54.57	0.27
V3T1	67.00	4.73	33.07	0.580	0.49	2.73	203.60	90.33	0.89
V3T2	78.60	4.30	31.17	0.563	0.47	2.59	170.43	90.57	0.74
V3T3	72.33	4.43	31.83	0.653	0.47	2.58	223.57	89.77	0.99
V3T4	82.47	4.73	34.23	0.676	0.47	2.43	263.67	87.70	1.22
V3T5	45.67	4.83	31.13	0.620	0.31	1.87	203.67	64.00	0.72
V3T6	41.63	3.87	25.57	0.377	0.23	1.67	97.23	66.19	0.28
V4T1	85.87	4.57	34.43	0.547	0.50	2.78	233.87	88.47	1.22
V4T2	75.67	5.07	37.57	0.550	0.53	2.57	213.93	88.67	1.18
V4T3	84.80	3.83	39.03	0.607	0.50	2.41	240.33	90.97	1.18
V4T4	90.63	4.47	38.90	0.587	0.46	2.49	275.30	85.37	1.29
V4T5	55.47	5.00	29.43	0.387	0.30	1.65	113.67	60.30	0.36
V4T6	42.87	4.30	18.90	0.323	0.22	1.58	72.33	49.40	0.21
CD at 5%	8.57	1.18	6.09	0.681	0.59	0.30	38.64	9.42	0.24

plates placed at 25^{0}C (ISTA,1999) in a seed germinator (Calton, India). The germination counts were performed at 4 and 14 days and the mean percentage of normal seedlings was calculated. The data recorded in the study were analyzed statistically Gomez and Gomez (1984).

Significantly higher plant height (68.97), number of branches per plant (5.16), and number of fruits per plant (32.6) were recorded in variety Kashi Vishesh. The effect with regard to 10 fruit weight and seed recovery was insignificant but maximum values were noted in Kashi Anupam. Significantly higher fruit yield (193.69 q ha^{-1}) was recorded in Kashi Amrit. Though seed yield was not influenced significantly among the varieties. However, maximum seed yield was obtained in Hisar Arun followed by Kashi Anupam (Table-1). Kaur and Kanwar (2006) also noticed similar type of response in different tomato genotypes.

The maximum plant height (83.29cm), number of fruits per plant (37.46), fruit yield (276.86 q ha^{-1}) and seed yield (1.37 q ha^{-1}) were found under 9 October planting date. It may be due to availability of optimum temperature for growth, flowering and fruiting by transplanting at this time which resulted in maximum fruit and seed yield (q ha^{-1}). Several workers have reported almost similar results using different planting dates. (Kadam and Deore 1990, Kadam *et al.,* 1993 and Shantha *et al.,* 2002. The maximum number of branches per plant (5.01) and test weight (2.82 g) was noted on 9 September planting. It may be due to long period taken for growth and availability of optimum temperature at the time of fertilization and development of seed. Significantly maximum germination percent was found on 25 August planting date which was at par with other planting dates except last two planting dates. Non-significant effect was noted for 10 fruit weight and seed recovery percent and maximum value was recorded 0.667 kg and 0.52 per cent on 9 October and 24 September planting date, respectively (Table-2). The interaction effects revealed that maximum plant height (83.33 cm), number of fruits per plant (42.83) and fruit yield (290.1 q ha^{-1}) were found under Kashi Vishesh planted on 9 October. Similar findings about transplanting dates were noted by Badhan *et al*. (1999) and Bhardwaj and Sharma (1996)in peas. Maximum number of branches (5.93) was noted in variety Kashi Vishesh on 9 September transplanting. Significantly higher test weight (3.2g) was found in Kashi Anupam on 24 September planting, germination (93.47%) in Kashi Anupam on 9 September planting. The 10 fruit weight and seed recovery were non significant.

References

Badhan BS, Singh M., Dhillon TS, Dhillon GS and Singh M (1999). The assessment of genotypes x environment interaction in garden pea (*Pisum sativum* L.). J. Res. Punjab Agril. Univ. 36(1-2): 55-60.

Bhardwaj ML and Sharma IM (1996). Performance of early pea genotypes under different sowing time in the hills of Himanchal Pradesh. J. Hill Res. 9(1): 62-64.

Gomez KA and Gomez AA (1984). Statistical Procedure for Agricultural Research, 2nd Edition, Wiley Intersciences Pub., New York.

ISTA (1999). International rules for seed testing. Seed Sci. Technol. 13: 299-520.

Kadam DD, Shete MB and Deore BP (1993). Response of tomato to planting dates and linear regression models for yield prediction. Annal. Pl. Physiol. 7(1): 103.106.

Kadam DD and Deore BP (1990). Influence of planting dates on yield and fruit characters of tomato. J. Maharastra Agril. Univ. 15(2): 264-265.

Kaur M and Kanwar JS (2006). Response of genotypes and planting dates to fruit and seed yield of tomato. Haryana J. Hort. Sci. 35(3/4): 331-334.

Shantha Nagarajan, Pandita VK and Sinha SN (2002). Thermal requirement in garden pea (Pisum sativum) for seed production. Indian J. Agril. Sci. 72(11): 667-669.