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Short Note

Performance of in-determinate hybrids/open pollinated varieties of tomato (*Lycopersicon esculentum* Mill.) under protected environment in mid hills of western Himalaya

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Tomato is an important off-season vegetable of hilly regions and brings lucrative returns to the growers. However, its productivity and quality is affected under open condition due to various biotic and abiotic stresses during the crop production period. Tomato is highly sensitive to low as well as high temperature, and fruit set and subsequent fruit development is severely effected if the night temperature falls below 13°C and day temperature rises above 38°C. Further, it has been observed that the tomato crop grown in protected environment with effect from April onwards, generally exhibits poor performance after rainy season due to various biotic and abiotic stresses, which necessitate growing of fresh crop during autumn winter season under protected condition in low/mid hills for getting higher yield, better quality produce, and efficient as well as judicious utilization of greenhouses. Mid hills of western Himalaya offer tremendous potential for enhancing productivity and quality of off-season tomato by resorting to protected cultivation, which ensures good quality produce and high productivity due to prevalence of prolonged congenial environment and lesser incidence of insect pests and diseases. In general, tomato grown in polyhouses fetches higher price as the produce is of very high quality and very less pesticides are used in comparison to the crop grown in open field conditions. Moreover, the keeping quality of the produce is considerably superior to the tomato purchased from local market. Keeping above considerations in view, twenty four hybrids/open pollinated varieties (hybrids-21 and open pollinated varieties-3) were evaluated during autumn winter 2006-07 in medium tech-polyhouse, measuring 24 x 10 m having fan pad system and drip irrigation facility, at the vegetable farm, Department of Vegetable Science, CSK HPKV, Palampur, to identify the most promising hybrid/OP variety in mid hills of western Himalaya. The crop was transplanted in September 2006 at a spacing of 90 x 30 cm. The plants were trained on two stems and fertilized with liquid fertilizer at weekly intervals at fruit set stage onwards. Ten plants of each genotype were grown and mean data was calculated by taking the mean of five competitive plants. Data on marketable yield per plant, marketable fruits per plant and average fruit weight were recorded. Among the hybrids and open pollinated varieties, T-67 produced the highest marketable yield

Table 1. Marketable yield, number of marketable fruits per plant and average fruit weight of tomato in medium tech polyhouse

Hybrids/ OP varieties of tomato	Marketable yield per plant (kg)	Number of marketable fruits per plant	Average fruit weight (g)
T-65	0.385	3.25	118.46
T-68	0.399	16.56	24.09
Palam Pride	0.483	10.00	48.30
T-26	0.720	11.80	61.02
Palam Pink	0.780	8.80	88.64
BL-333-3	0.820	11.70	70.09
T-71	0.827	10.83	76.36
T-66	0.935	17.17	54.46
Solan Sindhur	0.943	15.67	60.18
T-63	0.950	16.20	58.64
T-57	0.988	19.40	50.93
T-74	1.002	16.20	61.85
T-70	1.050	15.16	69.23
T-25	1.194	12.80	93.28
T-58	1.200	16.25	73.85
T-61	1.274	18.80	67.77
T-59	1.302	27.00	48.22
T-62	1.426	29.60	48.18
T-55	1.632	19.60	83.27
T-54	1.660	25.50	65.10
T-57	1.815	39.75	45.66
T-51	1.853	30.17	61.42
T-60	1.958	48.00	40.79
T-67	1.963	34.00	57.74
Overall Mean	1.150	19.76	63.65
Standard deviation	0.460	10.26	19.05
Coefficient of variation (%)	40.00	51.92	29.23

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per plant (1.963 kg) followed by T-60 (1.958 kg) and T-51 (1.853 kg). Highest average number of marketable fruits per plant was observed in T-60 (48.00) followed by T-57 (39.75) and T-67 (34.00) (Table 1). Whereas the maximum average fruit weight was recorded in T-65 (118.46 g) followed by T-25 (93.28 g) and Palam Pink (88.64 g). However, the average fruit weight varied from 24.09 to 118.46 g, which exhibited wide variation among the varieties/hybrids tested.

The mean marketable yield per plant varied from 0.385 to 1.963 kg. The average number of fruits per plant varied from 3.25 to 48.00. The results revealed wide variation for marketable fruits per plant followed by marketable fruit yield per plant and average fruit weight among the various indeterminate hybrids/OP varieties of tomato, which was evident from their high coefficient of variation. Dutta (1993) evaluated 29 varieties of tomato during spring summer and rainy autumn seasons in Assam under protected conditions and observed significant variation for marketable yield. Munshi and Kumar (2005) evaluated tomato hybrids in low cost polyhouses and observed variation for yield among the tomato hybrids, which varied from 3.5 kg/plant in Pusa Uphar to 4.4 kg/plant in DTH-7.

The studies revealed that hybrids T-67, T-60 and T-51, which produced highest marketable yield per plant in medium cost polyhouse along with high number of marketable fruits as well as high average fruit weight, can be grown commercially during autumn winter season in low and mid hills of North western Himalaya, and the produce can be marketed during November-February, when there is scarcity of tomato in adjoining plains as well as in local market. Moreover, the produce from these polyhouses ripens uniformly as compared to produce from open cultivation, where fruit ripening is a serious problem.

References

Dutta T 1993. Protected cover cultivation for humid regions. *In: National Conference on Plastic in Agriculture* (Souvenir). Organised by National Committee on the use of Plasticulture in Agriculture, Ministry of Agriculture, Department of Agriculture and Cooperation, New Delhi. pp 95-102.

Munshi AD and Kumar R 2005. Variety evaluation and planting time standardization for off-season production of tomato and capsicum in low cost polyhouse. *In:* Proceedings XI Intl. Conf. Plasticulture and Precision Farming, eds. Chaudhary ML, Chandra P and Misra P National Committee on Plasticulture Applications in Horticulture. Ministry of Agriculture, Govt of India, New Delhi. pp 393-95.

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