



## Factor productivity of agro-techniques in tomato cultivation : An economic analysis

CHHABI DE, V.K. SINGH, BABY DEY, M.K. SINGH AND NIRMAL DE

### SUMMARY

Input-output data were collected from on farm trials of hybrid and open pollinated varieties of tomato grown in the research farm of Indian Institute of Vegetable Research, during 2001-02 to 2006-07. Seven determinate tomato varieties namely, CO-3, Sel-10, Punjab Chhuhara, Sel-15, DVRT-2, Sel-7, ARTH-3 and one hybrid STH-537 in one set of experiment and seven hybrids ARTH-16, ARTH-4, ARTH-128, Gotya, SC-2, BSS-40, BSS-99 and one open pollinated variety Arka Vikas in another set of experiments were grown in the Gangetic alluvial soil of Varanasi, Uttar Pradesh. The plants were grown under different levels of nutrition N @ 120, 200, 300 and 400 kg/ha, P<sub>2</sub>O<sub>5</sub> @ 60, 80, 120 and 150 kg/ha and K @ 60, 100, 120 and 150 kg/ha in alluvial soil. A significant variation in yield and yield parameter was recorded among the tested open pollinated varieties and hybrids. The highest yield was recorded in Sel-15 (58.1 t/ha) at par to control hybrid STH-537 (56.64 t/ha) followed by open pollinated varieties Sel-10 and Punjab Chhuhara (53.5 and 51.6 t/ha, respectively). Yield of CO-3, DVRT-2, Sel-7 and ARTH-3 was ranging between 41.9 to 48.6 t/ha, indicating an increase of 2.5 to 3 times higher yield than national average of 18 t/ha. Among the tested hybrids, highest yield was recorded in BSS-99 (76 t/ha) followed by BSS-40 (71.3 t/ha) as compared to National check, Arka Vikas variety (44.1 t/ha) under staking condition. The increase in tomato yield under staking condition was remarkable for evaluated seven hybrids and one open pollinated variety. The highest cost: benefit ratio was found in BSS-99 (1:4.0) followed by BSS-40 (1:3.69) under staked condition as compared to (1:3.1) and (1:2.75) under non-staked condition. The law of diminishing return was established in yield response curve when treated with fertilizer inputs. Application of fertilizer nitrogen beyond 200 kg/ha showed a negative effect on yield and benefit: cost ratio. Interventions of fertilizer management technology recorded an additional gain of 46 q/ha in open pollinated variety and 110 q/ha yield in private sector hybrids in tomato. An increase in 33per cent factor productivity was realized under intervention of staking in 3 tier technology in indeterminate tomato hybrid. Variation in type of seed (open pollinated to hybrid) induced 17 per cent increase in factor productivity. Fertilizer management technologies on average enhanced 22 per cent factor productivity in tomato irrespective of genetic makeup.

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A wide diversity and complexity of component agro-technologies are used in India to raise vegetables under various agro-climatic zones. These include tools and equipment (manual, animal, and machine) to prepare land in different ways (*i.e.*, flat, raised bed, etc.), different

seeding methods (direct in line or broadcast, transplanting, and propagation), a wide variety of crop management methods (including crop protection, such as staking, mulching, covering etc., against environmental stresses), crop protection methods (use of chemicals and integrated

**Address of the corresponding author :**

**NIRMAL DE**, Department of Soil Science and Agricultural Chemistry, Institute of Agricultural Sciences, Banaras Hindu University, VARANASI (U.P) INDIA  
Email : nirmalde@gmail.com

**Address of the co-authors :**

**CHHABI DE**, Department of Economics, Mankar College, BURDWAN (W.B.) INDIA

**V.K. SINGH**, Department of Economics, Udai Pratap Autonomous College, VARANASI (U.P.) INDIA

**BABY DEY**, Department of Economics, Harin Gata Mahavidyalaya, NADIA (W.B.) INDIA

**M.K. SINGH**, Department of Agricultural Economics, Faculty of Agriculture, Udai Pratap Autonomous College, VARANASI (U.P.) INDIA