# POTATO AND TOMATO PRODUCTION AS INFLUENCED BY STIONIC EFFECT AND ASSESSMENT THE SHELF LIFE OF TOMATO

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## Extended summary

The two factorial (Factor-A: BARI Tomato-1: $V_1$, BARI Tomato-2:$V_2$, BARI Tomato -14:$V_3$ and factor-B: potato cultivar(s) ; Diamant: $P_1$, Mulata: $P_2$, Cardinal:P3) experiment was laid out in Randomized Complete Block Design (RCBD) with three replications, at the Horticultural farm of Sher-e-Bangla Agricultural University, Dhaka, Bangladesh with the following objectives-

a) To find out the suitable graft compatible among cultivars of tomato and potato.
b) To study the performance of grafted plants against the diseases and ensuring the higher yield.
c) To achieve two types of products from the (same) grafted plant at a time from the same land.
d) To asses the shelf life of tomato achieved from grafted plants.
e) To find out the Benefit Cost Ratio (BCR).

The highest mortality (30.50%) was recorded due to combined effect of ($V_1P_1$ scion from BARI Tomato-1 and P1: as rootstock; Diamant variety of Potato) and the minimum mortality (19.45%) was found from V3P3 (BARI Tomato – 14ardinal variety of potato). Due to combined effect of scion and rootstock, the maximum single weight of tomato fruit (45.92 g), number of tomato fruits per plant (19.07), dry mater content of tomato leaves (14.16%), dry mater content of tomato fruit (14.79%), yield of tomato fruit per plant (1.99 kg) and yield of tomato (68.15 t/ha) was measured from the treatment combination of $V_3P_3$ while the minimum was recorded from V1P1. Due to effect of rootstock Cardinal performed the maximum number of tuber (8.60), weight of single tuber (30.70 g), yield per plot (31.68 kg tuber) and yield per hectare (9.13 tonnes) and the minimum result were found from P1 (Diamant rootstock) at above observations. The highest shelf-life (40.53 days) was counted in $V_3T4$ (BARI Tomato-14 when tomato fruits were intact with tuber as grafted condition at ambient temperature viz., room condition) and the minimum was recorded in V1T0 (when the fruits of BARI Tomato-1 were at ambient condition) from the control treatment. The maximum benefit cost ration (2.65) was obtained from the treatment combination of V3P3 and the minimum (1.91) was noted from V1P1). This experiment was conducted only AEZ No. 28. For more confirmation of the results it may be conducted other agro-ecological zones of Bangladesh. It may be concluded from above study, Cardinal (rootstock) and BARI Tomato -14 (as scion) is more compatible compare to other combinations for successfully production of potato and tomato from the grafted plant at a time.

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**Table 1. Combined effect of scion (tomato variety) and rootstock on the yield attributs , yield of tomato production and economic analysis**

| Treatments | Mortality (%) | Single tomato fruit weight (g) | Number of fruit per plant | Dry matter (%) content leaves | Dry matter (%) content of fruits | Yield of tomato per plant (kg) | Yield of tomato per hectare | Benefit Cost Ratio (BCR) |
|---|---|---|---|---|---|---|---|---|
| $V_1P_1$ | 30.50 | 38.03 | 14.93 | 12.14 | 13.32 | 1.17 | 48.82 | 1.91 |
| $V_1P_2$ | 24.99 | 39.64 | 16.01 | 12.41 | 13.50 | 1.30 | 54.23 | 2.15 |
| $V_1P_3$ | 23.73 | 42.42 | 17.07 | 13.19 | 13.99 | 1.64 | 57.76 | 2.35 |
| $V_2P_1$ | 28.84 | 40.04 | 15.71 | 12.56 | 13.67 | 1.35 | 56.10 | 2.16 |
| $V_2P_2$ | 23.33 | 41.66 | 17.84 | 12.83 | 13.84 | 1.48 | 61.50 | 2.45 |
| $V_2P_3$ | 22.07 | 44.44 | 17.99 | 13.61 | 14.35 | 1.81 | 65.03 | 2.55 |
| $V_3P_1$ | 26.22 | 41.53 | 16.94 | 13.11 | 14.11 | 1.52 | 63.37 | 2.46 |
| $V_3P_2$ | 20.71 | 43.14 | 18.01 | 13.39 | 14.30 | 1.65 | 64.62 | 2.51 |
| $V_3P_3$ | 19.45 | 45.92 | 19.07 | 14.16 | 14.79 | 1.99 | 68.15 | 2.65 |
| CV (%) | 7.29 | 8.25 | 7.71 | 9.95 | 8.97 | 6.63 | 8.89 | - |
| LSD (0.05) | 0.234 | 1.34 | 1.05 | 0.621 | 0.605 | 0.243 | 3.57 | - |

**Table 6. Assessment the self-life of tomato**

| Variety | Treatment(s) | Weight loss (%) during storage after | | | Shelf-life (days) |
|---|---|---|---|---|---|
| | | 3 days | 6 days | 9 days | |
| $V_1$ | $T_0$ | 6.23 | 12.80 | 16.93 | 10.13 |
| | $T_1$ | 5.10 | 8.82 | 10.96 | 15.33 |
| | $T_2$ | 5.79 | 8.97 | 11.47 | 14.01 |
| | $T_3$ | 4.15 | 5.19 | 7.03 | 23.78 |
| | $T_4$ | 2.25 | 4.15 | 5.05 | 35.09 |
| CV(%) | | 9.68 | 8.88 | 6.18 | 9.17 |
| LSD (0.05) | | 0.012 | 1.02 | 1.01 | 3.02 |
| $V_2$ | $T_0$ | 6.10 | 12.19 | 15.90 | 10.45 |
| | $T_1$ | 5.01 | 8.51 | 10.72 | 16.62 |
| | $T_2$ | 5.63 | 8.73 | 12.03 | 15.17 |
| | $T_3$ | 4.00 | 4.76 | 6.92 | 25.93 |
| | $T_4$ | 2.12 | 3.94 | 4.91 | 38.09 |
| CV(%) | | 9.68 | 8.88 | 6.18 | 9.17 |
| LSD (0.05) | | 0.014 | 0.74 | 1.33 | 4.12 |
| $V_3$ | $T_0$ | 6.03 | 12.17 | 16.06 | 11.00 |
| | $T_1$ | 4.96 | 8.02 | 10.00 | 16.66 |
| | $T_2$ | 5.09 | 9.00 | 11.02 | 15.12 |
| | $T_3$ | 4.06 | 4.99 | 7.01 | 25.16 |
| | $T_4$ | 2.01 | 3.83 | 4.80 | 40.53 |
| CV(%) | | 9.68 | 8.88 | 6.18 | 9.17 |
| LSD (0.05) | | 0.016 | 1.05 | 2.03 | 3.26 |