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Bio-efficacy of Supasol and its combination with AOSAS on quality and yield parameters of tomato and Capsicum (Nashik, 2023–24)

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Abstract

Foliar biostimulants and silicon-based formulations are gaining importance in improving fruit set, yield, and quality in vegetable crops. The present field investigation evaluated the bio-efficacy of Supasol (fruit-size enhancer) and AOSAS (orthosilicic acid-based silicon formulation), applied individually and in combination, on the performance of tomato (cv. Aryaman) and capsicum under Nashik field conditions during 2023–24. Treatments were imposed in a randomized complete block design with nine treatments (T_1 – T_9) and three replications. Foliar applications were given twice at flowering and fruit set stages. Observations on number of fruits per plant, average fruit weight, and yield per plant were subjected to one-way ANOVA followed by Tukey's HSD test ($\alpha = 0.05$). Combined applications of AOSAS + Supasol (T_5 – T_8) produced consistently higher fruit number and fruit weight than the untreated control, with maximum numerical increase recorded in T_7 . Although statistical significance was not detected at $\alpha = 0.05$ due to limited replication, the consistent numerical gains suggest a positive synergistic effect between AOSAS and Supasol. The results indicate that integrating foliar silicon and biostimulant technologies can enhance productivity and fruit quality in solanaceous vegetables, warranting further large-scale evaluation across locations.

Keywords: AOSAS, Supasol, silicon, foliar biostimulants, tomato, capsicum, yield, fruit weight

Introduction

Foliar application of silicon and specialized biostimulant formulations has received considerable interest as an agronomic strategy to improve crop vigor, stress tolerance, and fruit quality in vegetable crops. Recent field studies have demonstrated that bioavailable forms of silicon, particularly orthosilicic acid formulations like AOSAS, can enhance fruit yield and quality by strengthening cell walls, improving water relations, and modulating antioxidant responses. Similarly, biostimulant products such as Supasol are designed to promote fruit development and assimilate partitioning, potentially increasing marketable yield. This study evaluates the bio-efficacy of AOSAS and Supasol, alone and in combination, on tomato and capsicum under field conditions.

Materials and Methods

Field trials were conducted at Nashik, India, during the 2023–24 growing season on tomato (cv. Aryaman) and capsicum. The experiment was laid out in a randomized complete block design (RCBD) with nine treatments (T_1 – T_9) and three replications. Foliar sprays of AOSAS and Supasol, individually and in combination, were applied twice- at flowering and fruit set stages. The nine treatments imposed were: T_1 – AOSAS @ 1 ml/L; T_2 – AOSAS @ 2 ml/L; T_3 – Supasol @ 1 ml/L; T_4 – Supasol @ 2 ml/L; T_5 – AOSAS @ 1 ml/L + Supasol @ 1 ml/L; T_6 – AOSAS @ 2 ml/L + Supasol @ 2 ml/L; T_7 – AOSAS @ 1 ml/L + Supasol @ 2 ml/L; T_8 – AOSAS @ 2 ml/L + Supasol @ 1 ml/L; and T_9 – untreated control (UTC). Standard agronomic practices were followed. Data were collected on number of fruits per plant, average fruit weight, and yield per plant. Statistical analysis was carried out using one-way ANOVA followed by Tukey's HSD test ($\alpha = 0.05$).

Results

Combination treatments involving AOSAS and Supasol (T_5 – T_8) consistently produced higher fruit numbers and average fruit weight than the untreated control (T_9). Among these, T_7

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showed the maximum numerical increase in both crops. Although differences were not statistically significant at $\alpha = 0.05$, the numerical trends indicate synergistic effects of AOSAS and Supasol on yield parameters.

Discussion

The observed improvements with AOSAS and Supasol applications align with previous findings reporting beneficial effects of foliar silicon and biostimulant products on fruit development and stress resilience. Silicon improves structural integrity and water balance, while biostimulants like Supasol enhance assimilate flow to fruits, collectively contributing to better yield and quality. The nonsignificant results likely reflect limited replication rather than lack of biological response. Multi-location trials with larger replication are recommended for confirmation.

Conclusion

Combined foliar application of AOSAS and Supasol demonstrated consistent improvements in fruit number and weight for both tomato and capsicum under Nashik conditions. Though statistical significance was not achieved, the positive numerical trends indicate potential agronomic benefits and justify further largescale trials.

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