

INFLUENCE OF PLANT GROWTH REGULATORS ON MORPHO- PHYSIOLOGY AND YIELD OF TOMATO GROWN UNDER ROOFTOP GARDEN CONDITIONS

Mohammad Mahbub Islam*

Executive Summary

A pot experiment was conducted in the rooftop garden of Agricultural Botany Department of Sher-e-Bangla Agricultural University to study the effects of plant growth regulators on morpho-physiology and yield of tomato during October 2021 to April 2022. The twelve (12) treatments T_1 = Control, T_2 = 0.50 mM Salicylic Acid (SA), T_3 = 0.25 mM Methyl Jasmonate (MeJA), T_4 = 1 mg l⁻¹ Paclobutrazol (PBZ) in soil drench, T_5 = 25 mg l⁻¹ PBZ foliar, T_6 = 0.50 mM SA + 1 mg l⁻¹ PBZ in soil drench, T_7 = 0.50 mM SA + 25 mg l⁻¹ PBZ foliar, T_8 = 0.25 mM MeJA + 1 mg l⁻¹ PBZ in soil drench, T_9 = 0.25 mM MeJA + 25 mg l⁻¹ PBZ foliar, T_{10} =0.50 mM SA + 0.25 mM MeJA, T_{11} = 0.50 mM SA + 0.25 mM MeJA + 1 mg l⁻¹ PBZ in soil drench, T_{12} =0.50 mM SA + 0.25 mM MeJA + 25 mg l⁻¹ were taken in this experiment. The experiment was laid out in Completely Randomized Design (CRD) with four replications. The results of this study showed the significant effect on morpho-physiological characters and yield of tomato to different treatments. The plant growth regulators SA and MeJA significantly increased morphological characters such as plant height, length of internode but PBZ significantly decreased plant height and length of internode than that of control or T_1 treatment. The number of leaves and branches per plant increased in all treatments compared to control, T_1 treatment and suggesting that SA, MeJA and PBZ showed positive influence on the formation of leaves and branches of tomato. As number of leaves and branches, the chlorophyll content as measured in SPAD value significantly increased with SA, MeJA and PBZ compared to control, T_1 treatment. The application of PBZ showed more positive influenced on chlorophyll development in tomato than SA and MeJA. Fresh weight, dry weight and relative water content of leaf increased with the treatments of SA and MeJA but these values decreased with the treatments of PBZ. The reproductive characters such as number of flower clusters, number of flowers and fruits per plant increased with using SA, MeJA and PBZ compared to control. The minimum fruit length (38.79 mm) and diameter (31.29 mm) were found with PBZ in soil drench application but the foliar application PBZ showed higher value of fruit length (49.72 mm) and fruit diameter (47.78 mm). The application of PBZ both in soil and foliar spray increased number of fruits with smaller in size than control, T_1 treatment. The highest fruit yield of tomato (1554.00 g) was recorded from the treatment of T_{12} : 0.50 mM SA + 0.25 mM MeJA + 25 mg l⁻¹ PBZ foliar and the lowest yield (826.00 g) from the treatment of T_4 = 1 mg l⁻¹ PBZ application in soil drench. These results showed that foliar application of SA, MeJA and PBZ increased fruit yield of tomato by changing morpho-physiological characters and suggesting that foliar application of PBZ is more suitable than application of PBZ in soil drenching.

*Professor, Dept. of Agricultural Botany, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh