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# ENHANCING FRUIT CROPS RESILIENCE: HARNESSING NON MICROBIAL BIOSTIMULANTS FOR SUSTAINABLE MITIGATION OF ENVIRONMENTAL STRESSES

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## Abstract

Non-microbial biostimulants offer a promising avenue to enhance agricultural sustainability and productivity by improving plant growth, stress tolerance, and nutrient uptake. This review extensively examines the role of these biostimulants in horticulture, focusing on their mechanisms of action, effectiveness in mitigating abiotic stresses, impact on nutrient utilization efficiency, and influence on the growth, yield, and quality of fruit crops. By reviewing pertinent literature and analyzing current research trends, this study offers insights into the advantages, limitations, and prospects of non-microbial biostimulants in agriculture. Notable findings underscore the variability in effectiveness, regulatory hurdles, and cost considerations associated with these biostimulants, along with opportunities for further research, innovation, and regulatory alignment. Collaboration among researchers, policymakers, farmers, and industry stakeholders is essential to fully harness the potential of non-microbial biostimulants and integrate them into sustainable farming practices. This study contributes to a deeper comprehension of non-microbial biostimulants and their role in advancing agricultural sustainability and resilience.

*Key words:* abiotic stress, bioenhancers, nutrient uptake, quality, tolerance, yield

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