# ANNOTATION

## PHYSIOLOGICAL AND METABOLIC RESPONSE OF PLANTS INDUCED BY PHYTOHORMONE-BASED BIOSTIMULATORS

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Phytohormonal biostimulators have the potential to significantly reduce the need for mineral fertilizers. They can enhance nutrient use efficiency, replace synthetic plant care products, improve crop quality, support stress responses to abiotic factors, reduce disease prevalence, and accelerate plant growth and development. When integrated into agricultural strategies, applications of exogenous phytohormones can lead to productive, profitable, and environmentally sustainable outcomes. This study offers a valuable contribution to both science and agriculture, providing insights into external phytohormonal effects at physiological and metabolic levels for different growth strategy plants . The findings of this study, highlight the potential of phytohormonal applications to enhance productivity and resilience, serving as a guide for farmers to implement more sustainable and effective crop management practices. For winter oilseed rape, growth-related phytohormones (KIN 30 and IAA 30), enhanced nutrient accumulation, which correlated with increased carotenoid accumulation. This led to an increased pod number in winter oilseed rape. Similarly, in pea, both growth (KIN 120 and IAA 120) and stress-related (ABA 120, SA 30 and SA 90) phytohormones improved pod number by enhancing photosynthesis and chlorophyll a and b content. In lettuce, applications of growth (KIN 60) and stress-related (SA 30 and SA 45) with phytohormones resulted in increased plant productivity, attributed to higher sugar and carotenoid content. Applications with growth-growth phytohormone combinations (KIN+IAA in winter oilseed rape, IAA+GA in lettuce) significantly enhanced nutrient accumulation, which significantly increased their productivity. Similarly, in peas combined applications of phytohormones (KIN+GA and KIN+SA) resulted in increased sugar accumulation, which resulted in increased seed number per pod. Furthermore, this research demonstrated how phytohormones mitigate yield loss during drought. The enhanced nutrient accumulation, photosynthetic productivity and yield achieved through research offer a clear pathway for improving crop management practices, making this work a valuable contribution to both the scientific community

and the agriculture. Therefore, for the first time, work will also serve as a guide, ultimately helping agricultural practitioners optimize the practical use of phytohormonal biostimulators.