

## Development of an Organic Liquid Plant Growth Booster Formulation

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### ***Abstract***

Organic fertilizers, derived from plant, animal, or mineral sources, play a pivotal role in sustainable agriculture by enhancing soil fertility and contributing to a positive ecosystem. Unlike synthetic fertilizers, known for rapid nutrient release and potential environmental harm, organic fertilizers release nutrients gradually, meeting plant requirements while reducing leaching. Aligning with ecological farming principles, organic fertilizers minimize the carbon footprint in agriculture. However, current organic liquid fertilizers exhibit limited boosting ability compared to chemical growth boosters, affecting flower and yield outcomes. This study aims to develop an organic liquid fertilizer with growth and yield-boosting capabilities along with pest control properties. The fertilizer, fermented and prepared using banana, papaya, woodapple fruits and peels, moringa tender leaves and flowers, neem tender leaves, wild sunflower leaves, molasses, and old compost as an inoculum, resulted in two formulations: raw liquid fertilizer and nano emulsion liquid fertilizer. Testing these formulations on okra plants under six treatments, in comparison with Albert Solution® chemical liquid fertilizer, revealed significant differences in plant height, number of leaves, and yield ( $P < 0.005$ ). The highest yield was observed in treatments cultivated in topsoil + liquid fertilizer, while lower yields were recorded in liquid fertilizer + sand media. However, consistently higher yields were obtained in topsoil and compost-treated plants with organic liquid fertilizer. The days of flowering onset were influenced by the liquid organic fertilizer, with the nano emulsion formulation showing an average flowering onset of 53 days. However, these preliminary results suggest a possible positive effect on plant growth and yield increase, but further experiments are required for conclusive results.

***Keywords: Growth booster, Nano formulation, Organic liquid fertilizer, Slow-release nutrients***