

Title Synergistic effect of combining ionizing radiation and oxidizing agents on controlling degradation of Na-alginate for enhancing growth performance and increasing productivity of zeamaize plants

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Abstract

Radiation is a very effective tool for controlling the degradation of natural occurring polymers like Na-alginate which may be used in agricultural purposes. One of the principle factors for reducing the cost is achieving the degradation at low irradiation doses. The addition of some additives such as potassium persulfate (KPS), ammonium per-sulfate (APS), or H₂O₂ to Na-alginate polymers during irradiation process enhanced, accelerated, reduced the dose required for their degradation process and also improved the quality of the end use products. The highest degradation rate of Na-alginate was obtained when the APS was used. Molecular weight and structural changes of the degraded alginates were determined. The possible practical use of such degraded Na-alginate as a growth promoter for zeamaize plant was investigated. The use of radiation degraded alginate not only increases the productivity of zeamaize plant but also improve its quality. The results obtained showed that end product of irradiated Na-alginate may be benefited in agricultural purposes as growth promoter for some plants.