

**STUDY ON SEED MATURITY LEVEL AND EXTRACTION
MATERIALS ON THE IMPROVEMENT OF SEED QUALITY,
GROWTH, AND YIELD OF TOMATO PLANTS (*Solanum lycopersicum* L.)**

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ABSTRACT

The availability of high-quality tomato seed is crucial in tomato cultivation which are obtained from physiologically mature fruits with seeds at their peak condition and appropriate treatment to facilitate germination. The objective of this research is to determine the optimal combination of fruit maturity level and extraction materials for improving seed quality, growth, and yield of tomato plants. The research design employed a Completely Randomized Design (CRD) with two factors. The first factor was the seed maturity level, consisting early maturity, optimal maturity, and over maturity. The second factor was the extraction material, consisting direct water, 24-hour fermentation, 10 g/L calcium hydroxide for 20 minutes, and 2% HCl for 60 minutes. Data were analyzed using Analysis of Variance (ANOVA) at a 5% significance level. If ANOVA indicated a significant difference, Duncan's Multiple Range Test (DMRT) at a 5% significance level was conducted. The results showed no interaction between seed maturity levels and extraction material treatments. The treatment with optimal seed maturity level yielded the best results for seed quality parameters. Extraction with 2% HCl for 60 minutes exhibited the best results for seed germination, germination rate, vigor index, and maximum growth potential.

Keywords: Tomato, seed maturity level, extraction, seed quality