

## ABSTRACT

Tomato (*Solanum lycopersicum* L.) are an important horticultural crop in Indonesia. Declining tomato production is driven by declining land productivity due to soil nutrient deficiencies and inadequate cultivation techniques. The increasing demand for tomatoes necessitates the availability of tomatoes, both in terms of quantity and quality. One solution to increasing tomato production is the use of superior varieties, proper maintenance, adequate water supply, and balanced fertilization. Alternative fertilizers used are NPK fertilizer and liquid organic chicken eggshell fertilizer. The purpose of this study was to further investigate the effect of NPK fertilizer and liquid organic chicken eggshell fertilizer on tomato plant growth and production. This research was conducted at the Experimental Garden and Laboratory of the Faculty of Agriculture, Malikussaleh University, from March to May 2025. A factorial randomized block design was used with three replications. The main factor was NPK fertilizer, consisting of three levels: N0 (0 g/polybag), N1 (16 g/polybag), and N2 (24 g/polybag). The second factor was the concentration of chicken eggshell POC, which consisted of three levels: P0 (0 ml/L water), P1 (150 ml/L water), and P2 (200 ml/L water). The results showed that NPK fertilizer application had a significant to highly significant effect on plant height, stem diameter, flowering time, number of fruits per plant, fruit weight per unit, fruit length, fruit diameter, and fruit production per hectare. The best dose was N2 (24 g/polybag). Application of chicken eggshell POC concentrations had a highly significant effect on plant height, stem diameter, flowering time, fruit weight per unit, fruit length, and fruit production per hectare. The best concentration was P2 (200 ml/L water). There was a highly significant interaction between plant height, stem diameter, fruit length, and fruit production per hectare. The best results were obtained with NPK fertilizer 24 g/polybag + chicken eggshell POC 200 ml/L water (N2P2).

**Keywords:** Dose, concentration, quality, karuna variety