ABSTRACT

Tomato (*Solanum lycopersicum* Mill.), a horticultural commodity, plays a crucial role in maintaining food availability and supporting industrial processing activities. Declining tomato yields are typically attributed to suboptimal fertilization strategies and poor agricultural land quality. This study aims to investigate the effects of NPK fertilizer and liquid organic fertilizer from papaya peel waste on the growth and yield of tomato plants. The research was conducted at the Experimental Garden and Laboratory of the Faculty of Agriculture, Malikussaleh University, using a Randomized Block Design (RBD) with two factors: NPK fertilizer doses (0, 20, and 30 g per polybag) and liquid organic fertilizer from papaya peel waste (0, 200, and 300 ml/L). The results showed that NPK fertilizer significantly affected plant height, number of productive branches, chlorophyll content, age at flowering, fruit diameter, and fruit length. Application of liquid organic fertilizer from papaya peel waste significantly influenced the number of productive branches, fruit weight per plant, fruit diameter, and fruit length, as well as having a significant effect on the age at flowering. The interaction between NPK fertilizer doses and liquid organic fertilizer significantly affected fruit weight per plot and fruit length.

Keywords: Organic Fertilizer, Horticulture, Plant Nutrition, Crop Productivity, Soil Fertility.