ABSTRACT

Ultisol soil is a soil that has poor chemical properties characterized by high soil acidity, low to moderate soil organic matter content, low nutrient content of N, P, K, Ca, Mg, and has very low P availability. Efforts to improve the chemical properties of Ultisol soil are by fertilization. Fertilization that can be used consists of organic fertilizers and inorganic. This study aims to examine the response of organic fertilizers and inorganic fertilizers to soil chemical properties, plant nutrient uptake and shallot plant growth. This research was conducted in the Experimental Garden of Malikussaleh University using polybags from February to April 2024. This study used a non-factorial complete randomized design. This study consisted of three replications and there were 5 treatments and each treatment consisted of 5 polybag units so that there were 75 units of experimental units. The parameters observed of soil chemical properties consist are pH (H_2O), N-total, P-available, K-dd, nutrient uptake of N, P, K plants. Field observation parameters were plant height, number of leaves, and number of tillers. The results showed that in the treatment of cow manure (75 g/polybag), crab shells (8 g/polybag) and solid formulation fertilizer (2,43 g/polybag) were able to improve the chemical properties of Ultisol soil, consist are the pH value (H_2O) of soil, soil N-total, soil P-available, soil K-dd and nutrient uptake of Nitrogen, Phosphorus, and Potassium plants. Treatment namely solid formulation fertilizer at a dose of 2,43 g/polybag, affects the growth of shallot plants. This can be seen in the variable height of shallot plants aged 30 and 45 DAP. While the number of leaves at the age of 15-30 DAP and the number of tillers at the age of 30-45 DAP can be influenced by the provision of cow manure at a dose of 75 g/polybag.

Keywords: *Cow Manure, Crab Shell, Formulated Fertilizer, Soil Chemical Properties, Ultisol Soil.*