

ABSTRACT

The process towards food security or food self-sufficiency faces the challenge of increasing population growth. Agricultural land has experienced extensive degradation and its function, plus the use of inorganic fertilizers which causes degradation of soil structure. Conventional organic fertilizers are less effective, where the production process requires more time and labor. For that we need a solution in the management of materials or organic waste, to make it easier and more efficient to use. The solution offered is organic fertilizer produced from the residue of the combustion process in the downdraft gasification reactor which is named gasification organic fertilizer. Waste from cattle, goat, and chicken farms is used as raw material fuel. Whereby using livestock waste as fuel, is expected to overcome the problem of managing livestock waste. The test is carried out by testing the quality and effectiveness to determine the potential of the gasification organic fertilizer produced. A fertilizer quality test was carried out by testing for N, P, and K nutrients. The quality test showed that the gasified organic fertilizer produced had superior P (Phosphorus) nutrient content. The effectiveness test was carried out on tomato, eggplant, and chili seedlings. The effectiveness test carried out by the seedling planting test showed that the gasification organic fertilizer had fairly good effectiveness and was quite balanced with other commercial fertilizers tested.

Keywords: *population growth, livestock waste, downdraft gasification, the potential of gasified organic fertilizer.*