

## **ABSTRACT**

### **PERFORMANCE TEST AND ANALYSIS OF APPLICATION WATER PUMP WITH GAS FUEL IN SPRINKLER IRRIGATION SYSTEM PAKCOY PLANT (*Brassica juncea* L.)**

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The use of gasoline as fuel would surely increase production costs, because the price of fuel becomes more expensive whilst gasoline production are continuing to decrease. Farmers must choose alternative fuel cheaper to operate propulsion water pumps to reducing production cost. The purpose of this research was to test performance of the coefficient of uniformity, distribution uniformity, and application rate of sprinkler irrigation with gas fuel pumps, and to analyze the feasibility of the fuel gas as a replacement fuel for sprinkler irrigation pumps.

The research was conducted in Marga Agung village, Jati Agung sub-district, South Lampung in May-June 2015. Propulsion pump for irrigation sprinkler modified on the carburettor (fuel system). Carburetor in the engine pumps were replaced with universal carburetor throat. Then analyzes the physical properties of the soil in the research area. Irrigation system performance test was conducted using a single head nozzle sprinkler method. Portable Sprinkler irrigation systems with gas fuel pump was applied to the plant pakcoy with a lateral pipe. Sprinkling the plants based on soil moisture content in the soil measured through soil moisture tester.

The average fuel consumption by 0.51 kg of gas per hour, with total fuel used for the cultivation by 4.6 kg. Measurement value of the coefficient of uniformity flow obtained an average by 52,6%, while the value of distribution uniformity on average by 41.2%.

Uniformity testing performed using a single head nozzle sprinkler, so that the uniformity of flow less evenly spread. Based on the soil texture triangle (USDA), land in the research area had sandy loam texture.

Cultivation pakcoy using sprinkler irrigation portable with gas fuel pumps at 400m<sup>2</sup> land area deserves to be continued, and applied by farmers because the value of R/C ratio was 1.4 (R/C ratio > 1), as well as irrigation costs incurred

Rp.900,-/m<sup>3</sup> of irrigation water is cheaper than the cost of water from the Class IV of PDAM Way Rilau bandar Lampung, amounting Rp3.500,-/m<sup>3</sup> water.

Key word : modification, LPG gas, portable sprinkler, performance tes