ABSTRACT

The growing demand for domestic soybeans is not offset by increased production. Lack of supply in addition to insufficient land, also because of the lack of good care of soybean crops. The provision of fertilizers that are not appropriate and balanced will cause optimal growth that affects the quality and quantity of soybean production. Therefore it is important to know the soil nutrient content of the land and the provision of fertilizers in accordance with the needs of soybean crops.

The system created in this Final Task is a system that can know the levels of Nitrogen (N), Phosphorus (P), Potassium (K) soil and provide fertilization that suits the needs of soybean fields using Android applications based on IoT. The device consists of NPK sensor to measure soil content and flow sensor to calculate the discharge of sprayed fertilizer solution. The system uses LoRa frequency 920-923 MHz for data communication and uses the Antares platform as data storage.

From the results of tests conducted on devices and applications proved that the device can measure NPK nutrients with the same results as Analog NPK. The fertilization tool shows good accuracy with a small difference value of Too Little -0.02 ml, Ideal 1.33 ml, and Too Much 2.17 ml. LoRa network quality measurement with a distance of 1.02 km has an RSSI average value of -106.35 dBm and an average SNR value of -5.13. Delay monitoring of 0.051 seconds, delay controlling by 7.3 seconds, throughput value of 348 bps and packet loss of 19%.

Keywords: Soybeans, NPK sensors, LoRa, IoT.