

***PROTOTYPE OF AN AUTOMATED FERTILIZER MIXER
SYSTEM FOR CHILI PLANTS ON PEAT SOIL BASED ON
ESP32***

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ABSTRACT

Peat soil has extreme acidity with an average pH below 4.5, requiring neutralization using dolomite lime and fertilizer. The main issue is the non-homogeneous manual dissolution, which risks damaging plants and causes physical fatigue for farmers. This study builds an automatic mixer prototype based on the ESP32 microcontroller using a DC Gearbox Motor and a BTS7960 driver to stir heavy loads. The device is integrated wirelessly via Bluetooth Serial to receive dosage recommendations from a partner application, then processes them through the Solvent Calculation Algorithm to determine water volume and the Load Classification Algorithm to adjust motor speed in normal or intensive mode. Test results show the device is capable of mixing materials homogeneously with a safe concentration level for chili plants in the range of 722 to 999 PPM. Wireless communication proved stable in receiving data at a distance of one to ten meters. Repeated testing over two days proved the machine performs consistently and is safe to use thanks to the countdown timer feature. Meanwhile, pH testing confirms the system dissolves the fertilizer, indicated by a decrease in the solvent water pH level. In conclusion, this system effectively reduces the farmers' physical burden and provides web-based digital monitoring of the mixing history.

Keywords: *ESP32, Peat, Automated Mixer, Classification, Bluetooth.*