

Abstract

The melon plant (Cucumis melo L) is a species of plant from the Cucurbitaceae family whose growth is very dependent on the provision of water. In this final project, a smart irrigation system based on the Internet of Things using Takagi-Sugeno fuzzy logic was developed for the growth of melon plants in a greenhouse. This system utilizes a capacitive soil moisture sensor and a DS18B20 temperature sensor to control the solenoid valve that regulates water flow in the drip irrigation method. Data from sensors is sent in real-time to the cloud for monitoring via the website. The duration of the solenoid valve opening ranges from 0 to 720 seconds per irrigation session, depending on soil moisture and temperature conditions. Test results show that the smart irrigation system is successful in maintaining soil moisture levels in the range of 60% - 80%. However, the monitored growth of melon plants shows that the smart irrigation system is still unable to promote healthy growth, especially in terms of plant height and leaf width. This difference is caused by influencing factors such as soil conditions, moisture and nutrients in the soil. Nevertheless, smart irrigation systems still have the potential to be improved to support the growth of melon plants.

Keywords: Greenhouse, Smart irrigation, IoT, Fuzzy Logic, Melon, Takagi-Sugeno.