IOT-BASED AUTOMATED LIGHTING AND IRRIGATION SYSTEM FOR DRAGON FRUIT PLANTS WITH TELEGRAM NOTIFICATION

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ABSTRACT

Modern agriculture demands innovative approaches to improve efficiency and effectiveness in crop management. Dragon fruit, as a high-value horticultural commodity, requires consistent lighting and irrigation to ensure optimal growth. This study aims to design and develop an Internet of Things (IoT)-based automation system for lighting and watering dragon fruit plants, integrated with a Telegram notification feature. The system utilizes an ESP32 microcontroller connected to a soil moisture sensor, a light-dependent resistor (LDR), and a relay module to control a water pump and LED lighting. Real-time sensor readings determine when the pump or lighting system should be activated, while soil moisture levels are also displayed via an I2C LCD. A Telegram bot is incorporated to send automated and interactive notifications regarding soil moisture conditions and lighting status to the user. Test results indicate that the system operates autonomously and responsively, providing accurate notifications and enhancing the efficiency of plant care, especially in remote areas.

Keywords: Internet of Things, ESP32, Soil Moisture, LDR, Relay, Telegram, Dragon Fruit.