

" An IoT-based monitoring and control system for repelling insects, rodents, and birds utilizing 1 kHz and 20 kHz audio frequencies, UV-A light, and solar power to mitigate threats to rice crops."

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ABSTRACT

Conventional control of rice plant pests still relies on chemical pesticides, which cause pest resistance, environmental pollution, and health risks for farmers. This study aims to design an Insect Killer system program with a solar power source using a UV-A lamp to mitigate threats to rice plants based on the Internet of Things (IoT), enabling remote control of the device. The method used is Research and Development (R&D) through the stages of literature study, hardware and software design, component testing, and field testing for seven days. The system was designed using a 50 WP solar panel, a 30 Ah LiFePO₄ battery, an Arduino UNO, an 8 W ultraviolet lamp (365–400 nm), a 3,200–3,500 V electrified wire, a 20 kHz buzzer, an ESP32 module, a Firebase Realtime Database, and a Kodular application. Thus, the Insect Killer system program with a solar power source using a UV-A lamp for mitigating threats to rice plants based on the Internet of Things (IoT) is proven to be effective, efficient, and environmentally friendly as an integrated pest management solution for sustainable rice farming.

Key Words: Insect Killer, Solar Energy, Internet of Things (IoT), Ultraviolet Lamp, Ultrasonic Sensor, Rice Pest.