



**Title: Intelligent monitoring system for water estimation in pineapple crops from multispectral images and IoT sensors.**

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**Abstract:**

Efficient water management is a crucial factor that directly impacts pineapple crop yields. Inadequate water management can result in significant water losses and favor the proliferation of diseases and pests, negatively affecting both the farmer and the environment. Pineapple crop water requirements vary according to phenological stage, soil type, and altitude. To avoid water stress and its adverse effects on growth, it is essential to irrigate according to the water requirements of the plant, especially during the phases of greatest vegetative activity.

In this context, constant monitoring of environmental, soil and plant variables becomes an indispensable tool for efficient water management in the crop. During the last decade, the combination of digital images, IoT platforms and machine learning techniques has gained relevance for the development of interdisciplinary tools that facilitate the understanding of the complexity of agroecological and environmental systems.

This work presents the development of an intelligent agriculture system that serves as a decision support to determine

water requirements in MD2 variety pineapple crops. The system operates from data collected by sensors of environmental variables, sensors installed in the crop and multispectral images acquired with a drone. For data collection, an experiment was designed in a pineapple crop instrumented with various sensors, which transmit the information to an open source IoT platform where the data is stored and visualized.

In addition, multispectral images were captured using a MicaSense RedEdge-M camera adapted to a Phantom 4 Pro drone. Soil moisture, temperature and pH data were also manually recorded using a mobile application consisting of 9 modules, and SPAD values of plant chlorophyll levels were taken. The combination of these multi-platform data was used as predictor variables to estimate crop water requirements using different machine learning algorithms.

### **Keywords**

Smart agriculture, Internet of things IoT, Sensors in the crop, multispectral images, Soil water content

### **Biography:**

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