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Design of electronic devices for the monitoring of climatic variables in avocado production fields in Colombia

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Quantification of climatic variables such as precipitation and temperature and determination of their interactions inside the soil profile is very important in avocado systems as a tool for prompt and appropriate management of several aspects of crop production such as the avocado wilt complex (AWC). Commercial electronic devices are very expensive and present the disadvantage that are made and calibrated for different conditions and usually, most epidemiological models are not suitable for the Colombian conditions. The aim of this work was to design a low cost electronic device for the collection and transmission of climatic variables including moisture and temperature from inside of the soil profile. As a complement, a mobile application was designed based on a different mathematical model that allows having information in real time, which may be used as an early warning system for the AWC. This electronic device was calibrated for being used in the tropical lower montane humid forest (TLM-hf) and in the tropical lower montane very humid forest (TLM-vhf) life zones in Antioquia, Colombia (sensu Holdridge). Data obtained was correlated with data collected by climatic stations and the quantification within the soil profile of the moisture and temperature by standard methodologies of soil analysis. Besides, the early warning system designed was correlated with AWC. The low cost electronic device showed a correlation higher than 90% compared with data obtained from traditional climatic stations and standard methods of soil analysis. In addition, the early warning system achieved a prediction higher than 80% of the variables associated with AWC.

Biography

Joaquin Guillermo Ramirez Gil is an Agricultural Engineer, completed Master's in Agricultural Sciences and currently pursuing his PhD. He has published more than 14 articles in scientific journals.

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