PRECISION AGRICULTURE WITH MONITORING SYSTEM

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ABSTRACT

Precision Agriculture with Monitoring System is an automated agriculture system, which can be used by all level of society. This paper proposes a Precision Agriculture with Monitoring System to monitor sensor readings and control actuator to maintain the soil condition in the optimum range. The main objective of this project is to automatically supply water, acid and alkaline solution when the readings exceed optimum range and alert farmers when soil condition reach extreme range because it could lead to drying of crops. The software used in this project is LabVIEW since it is compatible with NI myRIO. NI myRIO is used as a platform to interface the sensors, which are soil moisture sensor, soil pH sensor and temperature sensor. The actuator, which is water pump is also interfaced via myRIO. Besides that, this project can help users to continuously monitor the crops and makes analysis based on the soil moisture content and soil pH value parameters. It informs the users of causes of extreme conditions that leads to deficiency of water or excess of acid level in the soil.

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INTRODUCTION

1.1   BACKGROUND OF STUDY

Precision Agriculture (PA) is one of the many modern farming techniques and a strategic way to improve the productivity of crops. The goal of PA is to ensure that the plants and soil receive what they need for optimum health. To live, plants need four essential elements such as water, air, nutrients and sunlight. The study of proper PA behaviour against economic production is that the amount of water should be applied when needed to ensure the crops will continue to thrive [1]. PA is an easy way for farmers to get information about crop production due to new and systematic technologies. This technology advancement incorporated with satellite crop monitoring which encourages continuous monitoring by spectral analysis of high image resolution for various fields and crops [2]. Satellite crop monitoring also can get a visual of the soil conditions and properties of crops within the desired area. It can be analyzed with a particular assessment system and proper agricultural equipment, plant farming measures are spatial and quantitative more precise than previous [3].

Various ways to help the quality of crop growth production such as by using high technology systems. Researchers are using sensors to investigate the matching crop with different soils and weather conditions. The sensors that generally used in agriculture purposes are expensive and need high power consumption [3]. The sensors for agricultural work require high resistance since they are exposed to rain, dust and unstable temperature [4]. Sensors that are commonly used in agriculture are soil moisture sensor, leaf sensor, electrical conductivity (EC), humidity sensor, pH sensor, water level sensor and Wireless Sensor Network (WSN).