

IMPLEMENTATION OF PID METHOD IN DESIGN AND DESIGN OF HUMIDITY CONTROL EQUIPMENT IN ARDUINO BASED AEROPONIC SYSTEMS

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ABSTRACT

One field that is increasingly developing in the current era is agriculture. The development of agriculture is characterized by the ease of planting patterns without soil, for example the aeroponic system. Pakchoy is a type of plant that uses an aeroponics system. In an aeroponic system, a temperature and humidity control system can be developed using a PID controller. This research aims to produce a system that functions to maintain humidity for pak choy plants using an Arduino-based PID control method. The limitations of the problem in this research are that the type of plant used as the research object is the pak choy type and the tuning method used in designing PID control is the Ziegler Nichols method. It is hoped that the system produced in this research can help pak choy plant farmers in improving plant quality by regulating plant moisture values. Parameter values K_p , K_i , and K_d The PID control results that have been designed are set using the Ziegler-Nichols II method with values, namely $K_p = 1.9$, $K_i = 1.5$ and $K_d = 0.3$. When tested indoors and outdoors, the PID control system performed well. Indoors with a value of rise time = 13s, settling time = 11 s, overshoot = 4.56%, and an average steady state of 2.69%. Meanwhile, outdoors, the rise time is 11s, settling time is 14s, overshoot = 6.78%, and the average steady state is = 6.1%.

Keywords: *Aeroponics, PID, Ziegler Nichols*