

## ABSTRACT

Hydroponic plants are gaining popularity in Indonesia due to their ease of cultivation and minimal land requirements. Hydroponics is a cultivation technique that employs a water-based medium without soil and focuses on meeting the nutritional needs of plants. The method used in this research is the Deep Flow Technique (DFT), which conserves electrical energy by utilizing stagnant water in PVC pipes. The water used to irrigate the hydroponic system contains essential nutrients required by plants, such as nutrients. Iron is a crucial nutrient for the formation of respiratory enzymes and can be provided through the process of electrolysis.

Electrolysis is a chemical transformation or decomposition reaction that occurs in an electrolyte with the assistance of an electrical current. The objective of this study is to enhance the iron content in red spinach while considering the pH of the water flowing into the hydroponic system.

The results of the tests conducted during the system design reveal an average water pH measurement of 6.128 using the PH405 sensor. Subsequently, the average increase in iron content with electrolysis-treated water in red spinach was 2.57 mg/liter, whereas the group without electrolysis had an average of 0.93 mg/liter. The enhancement of iron content with electrolysis-treated water was achieved by applying a voltage of 12V for one month of cultivation.

**Keywords:** *Hydroponics, Iron, Electrolysis, Nutrients*