

## ABSTRACT

Fertilization is one thing that can help to increase production and quality for plants. However, fertilization in Indonesia can be said to be ineffective. As a result, many problems can be caused. Some of the negative effects of ineffective fertilization are soil damage, decreased quality of plants, and environmental pollution. To solve these problems, a system that can apply effective fertilization is needed.

In this final project research, a system is designed to monitor and control fertilization which will be applied to tomato plants. Leaves on plants are used as parameters of soil fertility. Leaf images will be taken using a camera and will be processed by image processing. By looking at the color of the leaves, nutrient deficiencies in plants can be detected. The application of fertilizers needed by plants can save fertilizer consumption without reducing production quality.

From the results of the experiment and the implementation of the tools made, this final project is able to classify and provide fertilizer to plants. The percentage of accuracy of leaf color detection to determine the need for plant fertilizer is 87%.

**Keywords:** *control system, tomato cultivation fertilization, image processing*