# ABSTRACT

Hydroponic Water Spinach is an option for growing crops in areas with little agricultural land. So that water spinach grown hydroponically has high productivity. Hydroponic Water Spinach needs additional nutrients to be mixed into the air. Usually, the nutrients added to the air to get high productivity is AB mix. However, if the use of these nutrients is given in excess, the plant will become dry growth. So to reduce the nutrients, research was carried out by exposing plants to the high frequency called Sonic Bloom. growth will be monitored with the Internet of Things (IoT). Music is one of the high frequencies if played from a frequency of 3.500 – 5.00 Hz. The music used in the test included Dangdut, Jazz, and Murottal music. The three music and without treatment will be analyzed using Machine Learning to compare the predicted growth results.

the growth of hydroponic Water Spinach is monitored with sensors and cameras. Then with the microcontroller set the programming and to Database. So that the parameter data from the sensor can be visualized with Website and Telegram for data from Camera. To find out the prediction results, the data from the sensor is used as a dataset to create a Supervised Learning model. In testing We are used Decission Tree, Random Forest, and K-Nearest Neighbor algorithms to find the best model. And the best model is Random Forest at ratio 40:60 of spliting data with computing time 1,4 second, accuracy value is 0.99, precision value is 0.99, recall value is 0.99, and f1-score value is 0.99.

**Keywords**: Hydroponic Water Spinach, Sonic Bloom, Machine Learning, Smart Farming