BALINGIT, ALYSTER M., and **BAUTISTA, KRISTEL ANNE R.,** Department of Agricultural and Biosystems Engineering, Tarlac Agricultural University, Malacampa, Camiling, Tarlac, May 2022, **EXTRACTION OF ROTTEN BANANA WASTE AS POTENTIAL SOURCE FOR BIOETHANOL.**

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Most nations are facing two major challenges, energy crisis, and proper waste disposal. Living in one of the countries which export a huge volume of bananas can be a challenge because bananas spoil in 2-3 days. On the other hand, there is a high demand for bioethanol. Spoiled bananas are already considered waste. To address this, it is better if bioethanol is made from low-cost raw materials. With aim of minimizing waste from bananas and contributing to energy conservation, the researchers determined if extracted rotten banana waste is a potential source of bioethanol.

The factor used were the varieties of banana (Lakatan, Latundan, and Saba) and days of fermentation (3 days, 6 days, and 9 days). Each treatment was replicated three times. All the data gathered were tabulated and statistically analyzed using Analysis of Variance of the Two–Factorial Completely Randomized Design and treatments were compared using the Duncan's Multiple Range Test (DMRT).

The highest yield of bioethanol production was observed in 3 days of fermentation of Lakatan with 136 mL. However, the best combination of high-quality bioethanol is the 6 days fermentation of Lakatan because it has the highest alcohol content of 41.33% and the longest time of flame observed for 19.80 s. The return on investment in the extraction of rotten bananas to make bioethanol is 41.6%.

DEVELOPMENT OF SMART FARMING FOR THE LOWLAND STRAWBERRY (*Fragaria ananass*) PRODUCTION

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ABSTRACT

The developed system in this paper monitors the humidity levels, moisture content of the soil and surrounding temperature. Furthermore, parameter values such as maximum and minimum temperature, maximum and minimum humidity values can be monitored accordingly by sending an SMS to the system. This system was developed by using Arduino microcontroller, GSM module, moisture sensor and DHT11 temperature/humidity sensor. This design can be used for monitoring and controlling temperature and humidity value via SMS.

The developed smart greenhouse farming used an Arduino system that will monitor the monitor and control the water content of the soil using a moisture sensor which runs under the control of a microcontroller, a DHT 11 sensor to control and monitor the greenhouse humidity and proper temperature and a Short Messaging System (SMS) to notify the caretaker/ owner on the moisture level content and temperature/humidity of the greenhouse.

The system was successfully implemented in the greenhouse. The system is working properly that is to get temperature, humidity and soil moisture. The communication is properly done between temperature, humidity and soil moisture, and Arduino Mega 2560.

The system monitored and maintain the proper temperature, humidity and soil moisture content inside the greenhouse. The device has been successfully tested under

simulated conditions and showed the ability of controlling temperature, humidity and soil moisture.

The System notified the caretaker/farmer via Short Messaging System (SMS) for the notification status (information) and triggering the water pump. The device showed the capability of sending SMS holding the latest temperature and humidity information and also the status of the greenhouse.