

INTISARI

RANCANG BANGUN *PROTOTYPE* SISTEM PENGERING GABAH DENGAN DATA LOGGER SUHU, KELEMBABAN DAN KADAR AIR

OLEH:

ANNISA RAMADHANI NURDIYANTI

(17/416580/SV/14318)

Pengeringan gabah pada musim penghujan membuat para petani kewalahan karena datangnya hujan yang tidak terduga, gabah yang terkena hujan sehingga kadar air didalamnya bertambah akan menyebabkan kualitas beras menurun. Oleh karena itu dibuat rancang bangun *prototype* sistem pengering gabah dengan data logger yang dapat menampilkan *monitoring* suhu, kelembaban, serta kadar air. Tujuan dari penelitian ini ialah membuat rancang bangun *prototype* sistem pengering gabah yang dapat melakukan *monitoring* suhu, kelembaban, serta kadar air, menganalisis hasil *monitoring* suhu dan kelembaban saat proses pengeringan dan menganalisis hasil *monitoring* kadar air pada gabah sebelum dan sesudah dikeringkan. Komponen utama pada rancangan bangun ini ialah sensor DHT22, sensor *soil moisture*, *load cell*, Arduino UNO R3 ATmega328P Wifi ESP8266, motor servo dan *software* plx.daq. Pengujian dilakukan dengan dua tahap yakni pengujian komponen yaitu sensor DHT22, *soil moisture*, dan *load cell* dan pengujian secara keseluruhan alat dengan melakukan pengeringan pada gabah. Berdasarkan hasil pengujian komponen didapat nilai error tertinggi pada pengujian *soil moisture* dengan nilai *error* 25 % dan nilai error terkecil ada pada pengujian *load cell* dengan nilai *error* 0,10%. Berdasarkan hasil pengujian secara keseluruhan alat rancang bangun *prototype* sistem pengering dengan *monitoring*, suhu, kelembaban, serta kadar air dapat bekerja dengan baik. Hasil dari *monitoring* pada saat proses pengeringan didapat kestabilan suhu yang berkisar 40°C dan nilai kelembaban yang berkisar 60-70% dan kadar air saat sebelum proses pengeringan dilakukan memiliki nilai sebesar 38% dengan berat 351,00 gram menjadi 14% dengan berat 331,00 gram setelah proses pengeringan berlangsung selama 25 menit sehingga selisih berat gabah sebelum dikeringkan dan sesudah dikeringkan memiliki berat sebesar 20 gr.

Kata Kunci : *Monitoring*, Gabah, Pengeringan, sensor DHT 22, *soil moisture*, plx.daq, dan *load cell*

ABSTRACT

DESIGN OF PROTOTYPE GRAIN DRYING SYSTEM WITH LOGGER DATA TEMPERATURE, HUMADITY AND WATER CONTENT

By:

ANNISA RAMADHANI NURDIYANTI

(17/416580/SV/14318)

Drying grain in the rainy season makes farmers overwhelmed because of the unexpected rain, the grain is exposed to rain so that the water level increases will cause the quality of rice to decline. Therefore, a prototype of the grain dryer system was created with a data logger that can display temperature, humidity and water content monitoring. The purpose of this study is to design a prototype of a grain dryer system that can monitor temperature, humidity, and moisture content, analyze the results of monitoring temperature and humidity during the drying process and analyze the results of monitoring the moisture content in grain before and after drying. The main components in this design are DHT22 sensor, soil moisture sensor, load cell, Arduino UNO R3 ATmega328P Wifi ESP8266, servo motor and plx.daq software. The test was carried out in two stages namely component testing namely DHT22 sensor, soil moisture, and load cell and overall testing of the device by drying the grain. Based on the component test results obtained the highest error value in soil moisture testing with an error value of 25% and the smallest error value is in the load cell test with an error value of 0.10%. Based on the overall test results prototype drying system design tools with monitoring, temperature, humidity, and moisture content can work well. The results of monitoring during the drying process obtained temperature stability which ranges from 40oC and humidity values ranging from 60-70% and moisture content before drying process has a value of 38% with a weight of 351.00 grams to 14% with a weight of 331.00 grams after the drying process lasts for 25 minutes so that the weight difference of grain before drying and after drying has a weight of 20 gr.

Key Word : Monitoring, Grain, Drying, DHT 22 sensor, soil moisture, plx.daq, and load cell