

DEVELOPMENT OF AN ELECTRONIC SENSOR FOR DATE SORTING BASED ON MOISTURE CONTENT

K.M. Ismail¹.

K.A. Al-Gaadi²

ABSTRACT

An electronic date moisture sensor utilizing a Wheatstone bridge circuit and an operational amplifier as a signal conditioner was developed. The sensor was designed to produce a voltage output that was proportional to date moisture content. The voltage output was amplified to activate a DC motor, which in turn could be used to operate a date separating device. Samples of dates of four different local types (Sokari, Rawthana, Om Al-Khashab and Nabtit-Aly) were used at different moisture contents to establish a correlation between the sensor voltage output and date moisture contents. The voltage output was found to be proportional to date moisture content. An output of less than 5.5v was associated with date moisture contents ranging between 2.5% and 26%. However, the voltage output was higher than 6v was associated with date moisture contents of 38% and above.

INTRODUCTION

Dates are fruits that are considered to be a traditional agricultural product in the Arab World. They are thought to be very nutritious and very popular fruits in the Kingdom of Saudi Arabia, where individual Saudi consumes, on the average, an annual amount of 35.8 kg (Saudi Ministry of Agriculture, 2007). The Kingdom of Saudi Arabia is one of the most important countries for date production, where its production in year 2007 was estimated at 982,546 tons (Saudi Ministry of Agriculture, 2008), making it the largest date producer in the world. The high production of dates and the growing demand for good quality dates and date pastries give a huge potential and importance to the date industry in Saudi Arabia. Currently, there are sixty one large date processing plants operating in the country for date grading and packaging, however, the capacities of these

1- Professor at the Univ. of Alex., Dept. of Agric. Eng., Alex., Egypt.

2- Associate Professor at King Saud Univ., Dept. of Agric. Eng., Precision Agriculture Research Chair (PARC), Riyadh, Saudi Arabia.