AUTOMATIC SYSTEMS FOR CONTROLLING FRUIT MOVEMENT, GRADING AND STORING UNDER LOW TEMPERATURE CONTROLLED ATMOSPHERE STORAGE

D. RAMESH BABU\textsuperscript{1}, N. GAYATRI\textsuperscript{2}, P. ISSAC PRASAD\textsuperscript{3}, S. JAGAN MOHAN RAO\textsuperscript{4} & K V. NARASIMHA RAO\textsuperscript{5}

\textsuperscript{1}Assistant Professor, Department of Mechanical Engineering, S R Engineering College, Warangal, Telangana and Research Scholar, Department of Mechanical Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, Andhra Pradesh, India

\textsuperscript{2}Assistant Professor, Department of Computer Science and Engineering, Kakatiya Institute of Technology and Science, Warangal, Telangana, India

\textsuperscript{3,5}Professor, Department of Mechanical Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, Andhra Pradesh, India

\textsuperscript{4}Professor Department of ECE, Ramachandra College of Engineering, Eluru, Andhra Pradesh, India

ABSTRACT

Cold storage units preserve fresh produce for extended shelf life. Operation of cold stores at present in India is done with multi commodity and common storage chambers where compatibility of fresh produce is not taken care of. Parameters to be maintained in the cold stores are: temperature of produce, temperature of the cooling coil, air temperature, humidity level, gas composition like oxygen, carbon-dioxide, ethylene, etc. for different fruits and vegetables to be stored in different chambers. These parameters need to be closely maintained to get best storage life of the produce. Most of the storage plants in India are equipped with manual or semi-automatic controls. Centralized chambers holding all types of fruits and vegetables at one place can lead to improper maintenance of storage conditions causing reduced life. The purpose of this study is to identify the technical requirements of computerized and automatic systems, so that fresh produce can be handled on automatic material handling systems.

Apple color quality was measured by an expert panel and compared with colorimeter grading system. Significant positive correlation was found between visual and colorimeter readings. Computerized systems for refrigeration systems, data logging is to be installed for careful monitoring of cooling and gas conditions inside the chambers. This will ensure fruits and vegetable stored at optimal shelf life conditions. The results of this study can help to develop software for a comprehensive cold storage warehouse management system.

KEYWORDS: Fruits and Vegetables, Color, Automatic Sorting-Grading, Cold Store, Controlled Atmosphere Store (CAS) & Automation

Received: Jun 09, 2020; Accepted: Jun 29, 2020; Published: Jul 23, 2020; Paper Id.: IJMPERDJUN2020430