

AUTOMATION OF ARECANUT BOILING AND DRYING PROCESSES USING EMBEDDED SYSTEM

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Introduction:

In recent years, labor scarcity has emerged as one of the foremost challenges in farming. However, harvesting and processing of arecanut becomes more difficult for farmers as it involves real hard, physical exertion, younger generation of labor are losing interest, with potentially harsh implication for arecanut cultivation. Researchers all around the world are working on developing arecanut processing machines, most of these are semi-automatic and requires human interventions. The design and fabrication of arecanut processing unit was based on arecanut available in the areas of Malenadu. The processing of raw arecanut in Malenadu region involves four steps de-husking, cutting, boiling and drying. Currently drying the nuts after boiling by open sun drying for 8 to 10 days is in practice. In the present work, an attempt is being made to automatize the boiling and drying processes, to save time, effort and labor. For automation of the entire setup Arduino UNO and 24 V DC battery have been used.

Objectives:

To automatize the arecanut boiling and drying processes using embedded system to reduce the processing time, effort and labor and to improve the quality of the arecanut, to achieve maximum efficiency utilizing the optimum energy.

Methodology:

All the three processing units namely boiling, coating and drying are constructed separately and then assembled in one frame. The hopper sends the arecanut to container. The arecanuts are sent for boiling process, where the sensor detects the arecanuts and sends it to the furnace. Provision will be made in the system to ensure desired quantity of arecanut to be sent to the furnace at a time, for boiling in water, with the help of sensors embedded in the system. The arecanut are heated for 30 minutes with a temperature of 100 degrees Celsius in the furnace. During the process of boiling, precipitates are added to give colour to the arecanut. Once the boiling is completed, they are extracted from the furnace without the water and fed into dryer (vibrating mesh). Here fans are used to blow hot air for drying the arecanuts. There are temperature and humidity sensors to make sure that the nuts are drying properly.

Conclusion:

The proposed unit is expected to carry out the arecanut boiling and drying process automatically using embedded system. By implementation of automation, it is expected to improve the efficiency, reduction in human time and effort. The system is expected to be safe, reliable and requires no skill for its operation.

Scope for future work:

The other processes can also be automated after successful performance of proposed unit. The work may be extend for atomizing the other processes.