

Solar dryers for copra - academic project helps coconut farmers get better returns

Here is proof that academic research has moved from lab to land and started showing results in the development of the community. The project "Popularisation of Solar Tunnel Dryers for Copra Production in Pollachi Region." of the Science for Equity Empowerment and Development Division (SEED) of the Department of Science and Technology (DST) implemented by a team in Dr. Mahalingam College of Engineering and Technology in Pollachi, has ensured that the coconut farmer is able to produce high quality copra. Six solar tunnel dryers have been constructed at Sulakkal, Devanampalayam, Mandrampalayam, Kanjampatti, Kondegoundenpalayam, and at Vanavarayar Institute of Agriculture in Manakkadavu in Phase I of the project.

Solar tunnel dryer

The project was introduced with

the objective to popularise the concept of solar tunnel dryer with biomass backup heater among the coconut farmers, coconut traders and self help group women, for producing high quality copra. The coconut farmers of this region were drying the nuts in the open. This was dependent on weather conditions and hence was hampered by rain and wind. Also, coconuts took six to eight days to dry in the open sun. Wastage was high due to environment and birds. With the solar tunnel dryers drying is possible in two to three days. Superior copra is produced as the drying takes place in closed hygienic conditions, and hence premium quality oil is also ensured.

The dryer is provided with biomass backup furnace to ensure that drying takes place even during non-sunshine period – evenings, nights and rainy season. One unit

of the solar tunnel dryer was set up in 2007-08 at Negamam. This was a great hit among farmers, and so the project for another 12 was sanctioned by DST for 2011-13.

The first phase of six dryers was launched recently. The second phase that will involve another six will begin shortly. The college will operate the dryers for five years, at no cost, under a memorandum of understanding with the respective Panchayats, after which they will be handed over to them. The project, with V.V. Sreenarayanan as the Principal Investigator, and S. Ayyappan as the Co-Principal Investigator, has ensured that coconut farmers get more returns with less investment and wastage. What makes the dryer even more attractive is the fact that it can be used to dry anything - from chillies, spices, grapes, groundnuts, and cocoa, to even clothes.

Solar Tunnel Drier With Thermal Storage

A natural convection solar tunnel drier integrated with sensible heat storage material was developed by Department of Mechanical Engineering, Dr. Mahalingam College of Engineering and Technology, Pollachi – 642 003, Tamil Nadu, India to test its performance for copra drying. The experiments were carried out with and without the integration of heat storage materials. Sand was used as the heat storage material in the solar tunnel drier. The drier reduces

the moisture content of copra from 52% (w.b.) to 7.2% (w.b.) in 52 h and 78 h respectively with and without the heat storage material. It produces 85% Milling Copra Grade 1 (MCG1). In open sun drying, moisture content reduced from 52.3% (w.b.) to about 7.8% in 172 h with an average of 53% MCG1. The average solar tunnel drier thermal efficiency was estimated to be about 18% in both the drying modes.

A community model solar greenhouse drier of size 4 m (W) × 10 m (L) × 3 m (H) at centre was designed and constructed at Negamam village. The semicircular portion of the drier was covered with UV (200 micron) stabilized polyethylene film. No post is used inside the greenhouse, allowing a better use of inside space. Three exhaust vents with adjustable butterfly valves operated manually have been provided at the top of the roof for removing the humid air



Solar tunnel drier



Drying of copra inside the drier

from the drier. Inside the drier the cement flooring was coated with black paint to improve its performance. The drier is provided with metallic racks for keeping the coconuts in layers for drying. The capacity of the drier was to dry 5000 coconuts per batch.

From the experimental work

conducted for the drying of copra in the natural convection solar tunnel drier, it was found that the copra can be dried from an initial moisture content of 52.3% (w.b.) to the required moisture level of 7% (w.b.) in 52 and 78 hours respectively with and without using the heat storage material (sand). The open sun drying takes 172

hours for reducing the moisture content of copra to the same level. The use of heat storage material provided continuous drying and reduced the drying time considerably compared to open sun drying. The copra obtained from the solar tunnel drier is of high quality.

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Board. He has applied for subsidy from Krishi Bhavan under ATMA for mulching with coconut husk in nutmeg. He was the convenor of the cluster programme implemented by the Board during 2006-08. He is of the opinion that the programme helped the farmers to make the practice of cultivating various intercrops along with coconut, which makes farming more profitable.

Shri. Joshi Joseph's advice to other coconut farmers is that multiple cropping/mixed cropping may be adopted for making coconut cultivation profitable. Good quality seedlings especially dwarf and hybrid varieties may be planted to get a good crop and yield. Maximum

tender nuts may be harvested for making better income. More dwarf varieties may be planted for the same. After cutting and removing the old senile and disease affected palms, new seedlings must be planted with proper spacing. Try to raise one's own nursery by selecting quality seed nuts from selected mother palms so that we don't need to depend on others for quality seedlings.

In the opinion of Joshi, Board's programme of Friends of Coconut Tree provides employment to many unemployed youths and makes them self-dependent. Besides, they have learned the scientific cultivation practices of coconut. Joshi is the president of the Chembrakunda

Coconut Producers Society registered with Coconut Development Board.

Joshi's role model is his father, Joseph who is also an active farmer. Joshi is supported by his mother Mary and his wife Shinsy. He is planning to purchase a mini Hitachi for making coconut planting easy. His advice to youngsters is to opt agriculture as a profession as it makes one self-dependent and independent. For further details Contact: Joshi M. Joseph, Manimala (H), Kattipara (PO), Thamarassery (Via), Kozhikode 673573, Ph: 9446953185/0495-2270237.

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