

Chapter 1

1.1- INTRODUCTION

Dehydration is most popular technique used for preservation of agricultural products including fruits even fish and meal. Drying techniques include open air drying, fuel fired drying, electrical drying and solar drying. The use of open air drying is cheap and most popular method used through the world but results in contamination of food, nutritional deterioration and consumes more time when compared to other dryers. Fuel fired dryer are totally dependent on conventional fossil fuels, firewood or coal which may cause pollution and contribute to deforestation and Cause environmental degradation. Electrical drying however consumes less time to dehydrate the crops and does not cause any of the pollution, but availability of electricity in rural areas where much of the drying of eatables takes place is still less.

Where as in contrast to all the above dryers solar dryer solar dryer is not only environmentally friendly but can be used both in urban and rural areas for domestic and commercial purpose and is much more simple compared to other forms of dryers. Solar dryers require much lesser time compared to other forms of dryers and it provide higher drying temperatures as drying takes place in an enclosed cabinet.

Various drying techniques are employed for drying of different food products every technique has its own advantages and disadvantages. Choosing of proper technique is necessary to preserve these perishable food products. The solar and biomass hybrid dryer is one such dryer which has achieved some level of acceptance. One of the important disadvantage of this dryer is that it cannot be used without any backup heater during night times and cloudy days. Introducing backup heater makes the dryer operational even beyond sunshine hours.

In many parts of the world there is growing awareness that renewable energy has an important role to play in extending technology to farmers in developing countries so that their productivity is increased. Even most of the agricultural community is concentrated in rural areas where there is a scarcity of electricity, so solar thermal technology is one such technology that is rapidly gaining acceptance as an energy saving method in agricultural applications. It is preferred as one of the best among various other alternative energy sources- It is abundant inexhaustible and non-polluting and principles of operation of various solar applications are simple. Even the growing awareness

DESIGN AND FABRICATION OF SOLAR BIOMASS DRYER USING FORCED CONVECTION

towards environmental pollution, deforestation global warming have paved a way for this solar technology. There is also promising future for this solar dryer as most of the solar powered appliances like solar illuminations, solar water heater, solar pumps etc. have firmly registered their presence in the market so the future for this emerging technology is very good. Solar air heater is a device that is used to heat air by using solar energy and use this air for various applications like crop drying space heating.

Drying process plays an important role in preservation of agricultural products. It is defined as process of moisture removal due to simultaneous heat and mass transfer. Mainly two types of moisture are present in food items they are chemically bound water and physically held water. In drying process it is only physically held water that is removed from the food product. The most important reason for popularity of dried food products is its longer life, easy storage and reduction in volume.

The product can be further improved by various processes. The application of this dryer in developing countries can reduce post-harvest losses and is economical because of low cost and does not make use of electricity thus improve the food availability in those countries.

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