

# Solar drying adds value to crop surplus

Fruits and vegetables are highly profitable commodities for both small- and large-scale farmers. These crops are often harvested in high volume over a short period of time, when quality is high but prices are low. Rates of loss and waste in fresh produce can be quite high, especially in developing countries. Solar drying of fresh fruits and vegetables is a simple processing technique that adds value to crop surpluses, preserves and extends food supplies, empowers smallholders and creates rural employment.

## Chimney solar dryer design

From Horticulture Innovation Lab researchers at UC Davis, the chimney solar dryer is designed to provide efficient drying even in hazy or partially cloudy conditions, using inexpensive and readily available materials. Other features of this design include:

- The chimney ensures continuous air flow around the product, thus increasing the speed of drying compared to other designs.
- This design's large heat-collection area ensures high temperatures and rapid water removal.
- Flexible design allows users to modify tray depth and size to fit consumer demands.



Designed by UC Davis researchers for the Horticulture Innovation Lab, the chimney solar dryer combines solar heat collection with rapid air flow for efficient drying of fresh produce.

## Benefits

- Cost-effective, small-scale processing option for smallholder farmers
- Easily modified to suit specific requirements of different products and climates
- Provides benefits of solar drying even in hazy or partially cloudy conditions
- Dries produce twice as fast as cabinet dryer designs

## Basic costs

- Clear plastic, 2-4 mm thick
- Dark-colored row cover fabric or black plastic
- Food-grade plastic mesh or galvanized screen
- Plywood
- Basic carpentry materials

Materials can be purchased for less than \$150; however, costs are subject to local variation.

## Helping build more chimney solar dryers

- **Manual for building, using and troubleshooting:** The Horticulture Innovation Lab has created a manual with a detailed materials list, isometric illustrations, photos, directions for how to build, troubleshooting tips and other user support.
- **Video series:** Short videos show how to build and use a chimney solar dryer. Find videos and manuals at: <https://horticulture.ucdavis.edu/chimney-solar-dryer>
- **Further testing, adapting and adoption:** Researchers with the Horticulture Innovation Lab have used chimney solar dryers with farmers in the United States, Ghana, Guinea, Kenya, Tanzania, Bangladesh, Thailand, Guatemala and Honduras.



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