



Clay pot cooler training at the Nyeleni Cooperative Society in Mopti, Mali; Photo credit: Djiguiba Boureima

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Cover: Oumaro Barry with clay pot coolers in Burkina Faso; Photo credit: Peter Rinker;

Page 3: Clay pot cooler schematic based on work by Peter Rinker, Movement e.V.



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# Evaporative Cooling for Fruit & Vegetable Storage



## A Guide to Assembling, Using, and Maintaining Clay Pot Coolers



[d-lab.mit.edu/clay-pot-coolers](http://d-lab.mit.edu/clay-pot-coolers)

# Why Use Clay Pot Coolers?

Using a clay pot cooler to store fruits and vegetables can reduce spoilage and prevent post-harvest losses.

If properly maintained, evaporative coolers provide many benefits to households, including:

- Reduced post-harvest losses
- Fewer trips to the market
- Cost savings
- Increased availability of nutritious vegetables



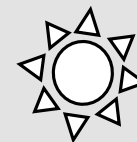
Djiguiba Boureima (left) and Kadidia Nienta (right) assembling a clay pot cooler in Samanko, Mali;  
Photo credit: Ba Germain Diarra



**DON'T**

To avoid spoilage or damaging the the clay pot cooler, stay away from these *don'ts*.

**DO NOT** store the cooler in direct sunlight.



**DO NOT** allow sand and covering to dry out.



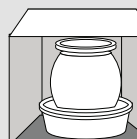
**DO NOT** leave the cooler uncovered.



**DO NOT** allow dust and dirt to accumulate.



**DO NOT** store in poorly ventilated areas.



**DO NOT** store meat, medicines or vaccines.



# Maintaining Your Cooler

Follow these best-practice guidelines to gain the maximum benefit from your clay pot cooler:



## Shade

Keep the cooler in a cool, shaded location, out of direct sunlight.



## Watering

The sand and cloth should be kept damp at all times. Typically, water should be added once a day.



## Covering

A damp cloth or burlap sack folded over several times should be placed over the top of the cooler.



## Hygiene

The cooler should be kept clean and sponged off regularly.



## Ventilation

The coolers should be located in a room with good air circulation or exposed to outside winds/breezes.



## Suitability

Only fruits and vegetables should be stored in coolers. They are not suitable for meat, dairy or medicines.

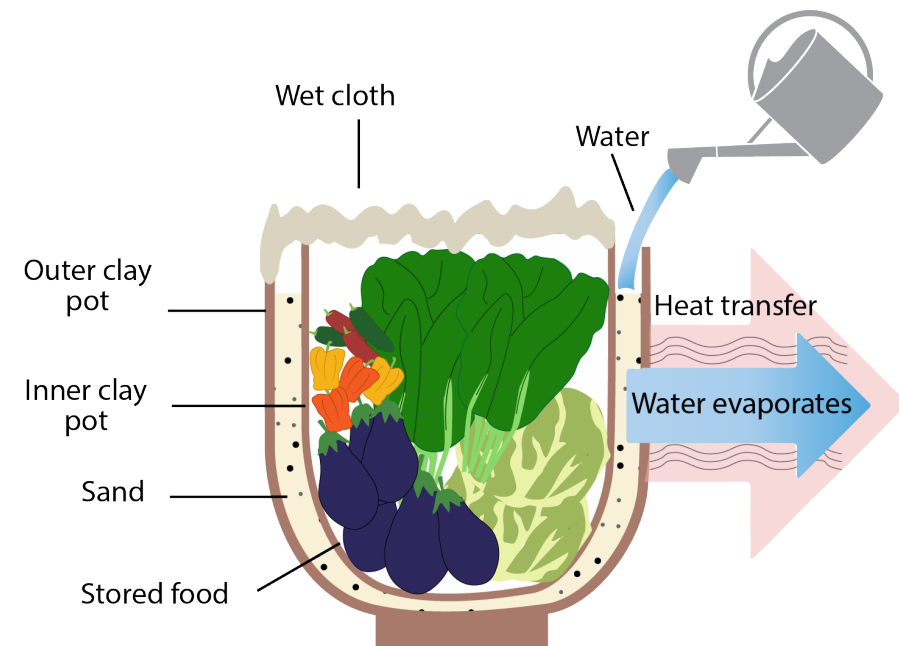
# How Does it Work?

Clay pot coolers are designed to cool air through the evaporation of water, providing a stable environment to store most fruits & vegetables.

- Wet sand placed between a larger outer pot, dish, or basin, keeps the fruits and vegetables inside the inner chamber cool.
- A jute bag or other absorbent cloth material placed over the opening protects its contents.



Left: Djiguiba Boureima; right: Kadidia Nienta; Photo credit: Djiguiba Boureima



# Design Options

## Pot-in-pot

- The inner pot can be clay, plastic or metal.
- The outer pot is made of clay and should be large enough to leave a 3-5 cm gap for sand to go between the two pots.



## Clay pot-in-plastic basin

- The inner pot is clay and can either be a round pot (like the ones commonly used for storing water) or have straight walls.
- The outer dish can be metal or plastic, and should be sized to leave at least a 3 cm gap between the outside of the clay pot and the inside of the dish.

## Clay pot-in-clay dish

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- The outer dish is made of clay and should be sized to leave at least a 3 cm gap between the outside of the clay pot and the inside of the dish.



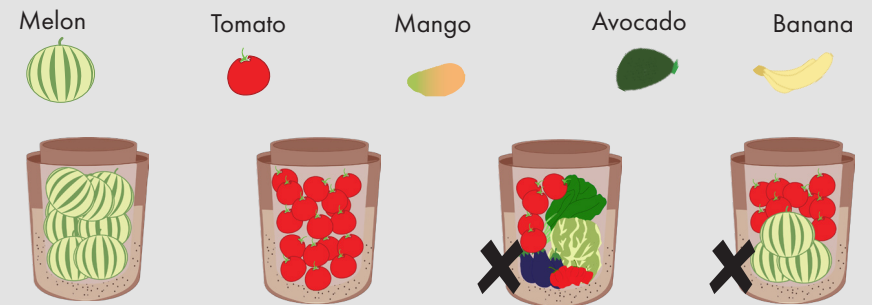
# Important to Know

The following tips will help you avoid spoiling your fruits and vegetables.

## Ethylene Producing

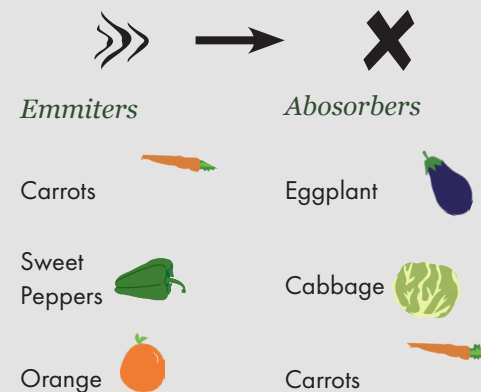
Many fruits produce a gas called ethylene, which spoils fruits and vegetables that are sensitive to it. These fruits should be stored separately from vegetables and each other.

Examples of ethylene producing fruits include:



## Odor Emitting/Producing

Certain fruits and vegetables can transmit their odors to others, affecting their taste.



## Not Suitable

Vegetables and other foods that easily rot in high humidity such as:

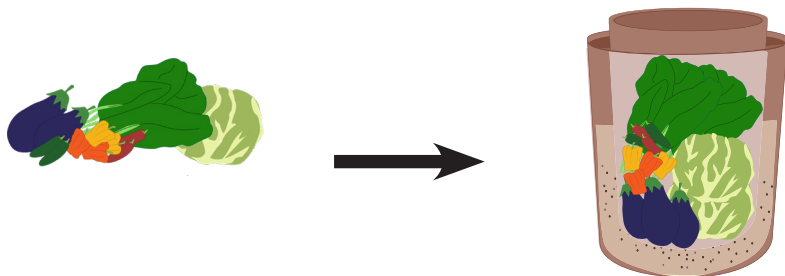


# Filling the Clay Pot Cooler

Make sure the fruits and vegetables are dry, in good condition, and free from dirt and insects.

## Store the fruits and vegetables

Place the fruits and vegetables in the inner pot. Be sure that the items added are able to be stored together. (See important information on page 9 about fruit and vegetable compatibility.)



## Cover the cooler



Wet a cloth or a piece of burlap and place it over the top of the inner pot so it is completely covered.

Squeeze out excess water before placing on the cooler.

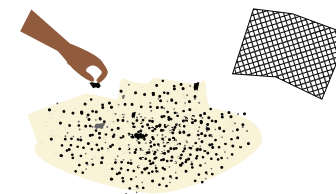


# Preparing the Sand

Large particles and dust need to be removed from the sand in order for it to evenly retain water for evaporation.

## Remove large particles

- It is a good idea to remove large particles and stones so they do not take up too much space.
- This can be done by hand or sieved through a 3-5 mm wire mesh.



## Remove dust

- It is very important to remove as much dust as possible so that it won't clog the pores of the clay pot.
- Remove the dust either by sieving through a thin cloth, or by "winnowing," which uses the wind to remove the dust. (See picture below.)



## Winnowing

To remove dust by winnowing, slowly pour the sand from shoulder height (you may need a stool depending on your height) onto a cloth on the ground.



# Assembling the Clay Pot Cooler

Consider assembling the clay pot cooler where it will be used, since the cooler is heavy and difficult to move when fully assembled.

## Instructions

### 1. Add a layer of sand

- Pour sand in the bottom of the outer pot to create an even surface for the inner pot to sit.
- The sand can be wet or dry when adding it to the pot.

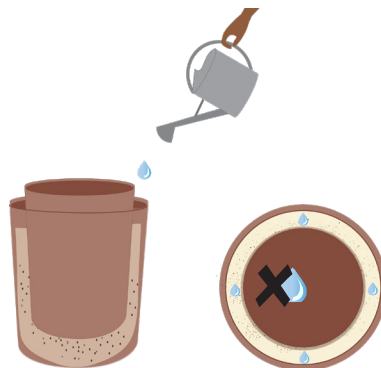
### 2. Insert the inner-pot

- Center the inner pot on the layer of sand inside the outer pot and fill the space between the two pots with additional sand.
- Make sure the top of the inner pot is at least 2 cm higher than that of the outer pot

### 3. Water the sand

- Add enough water to thoroughly wet the sand.
- Enough has been added when it takes a few seconds for the water to absorb from the top.
- If the inner pot begins to float, too much water has been added and will need to be drained before using the cooler.

## Pot-in-pot design



## Pot-in-plastic basin



## Pot-in-clay dish

