



Solar Drying Fruits and Vegetables

Review and Revision: Claudia Botzet, SDSU Extension Nutrition Field Specialist

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Drying is one of the oldest methods of preserving food. A solar dryer shortens the drying time by increasing temperatures and air currents.

Selecting foods for solar drying

Produce should be ripe but still firm. Overripe or bruised produce will spoil during the drying process.

Drying meat in a solar dryer is not recommended. Temperatures are not sufficiently controlled to produce a safe product. Dried fruits can be eaten with no additional preparation. Dried vegetables and fruits can be reconstituted and added to soups, stews, and other dishes.

Using the solar dryer

Weather conditions are unpredictable, so constant temperatures may not be achieved 100% of the time when using a solar dryer. Outdoor temperatures between 70 and 90°F, low humidity, clear skies, and wind are ideal drying conditions. The air inside solar dryers is 20 to 30 degrees warmer than the outside air. Drying time will need to be longer if the air temperature drops or the humidity rises.

Solar drying can begin early in the morning; peak drying time is between 10 a.m. and 2 p.m. Place the dryer in full sunlight with a southern exposure. Prop up one end of the dryer 6 to 8 inches to establish optimal air movement; you need to establish a cycle of dry air moving in and moist air moving out for the product to dry.

As the sun moves throughout the day, adjust the dryer to continually receive optimal sun's rays. Overnight the

produce should be brought inside and put into air-tight containers to prevent moisture reabsorption. Until the next drying day, store the produce in a refrigerator to prevent growth of microorganisms.

Drying times

Depending on temperatures and humidity, fruits will dry in 2–6 days and vegetables will dry in 3–5 days. For more information about drying times for specific produce refer to *So Easy to Preserve* (5th ed), Cooperative Extension Service, University of Georgia.

Fruits are considered dry when there is no visible moisture, pieces are pliable, not sticky, and have lost approximately 80% moisture.

Dried vegetables will be brittle with no visible moisture, shatter if hit with a hammer, and will have lost approximately 90% moisture.

Storage

Dried products need to be completely cooled before storing. Store products in a glass jar with a tight fitting lid or a self-sealing plastic bag to keep out moisture.

Some dried vegetables such as corn are best stored in a pillow case or cloth bag. When choosing a container, consider the following: clean and sanitary, moisture resistant, airtight, durable, easily opened and closed.

Additional drying tips

A piece of black cloth placed inside the dehydrator increases the temperature.

Secure the dryer with tie-downs or heavy rocks to keep it from blowing over in high winds.

Solar dryer for home use

Designed by Jennifer Achey, SDSU graduate student

Material list:

Quantity and Material

	Size
1 Plexiglass	24 x 48" – .093" thick
1 Plywood	24 x 48" – 1/4" thick
3 1" x 3" pine (untreated)	8 feet long
2 1" x 2" pine (untreated)	8 feet long
1 Fiberglass screen	36" x 70"
12 Pan-head sheet metal screws	#6 x 1/2" long

As needed

Drywall screws (fine thread)	1" and 1 1/2"
2 Door pulls	one 5 3/4" and one 4 7/8"
2 Small hinges	3" long
2 Hook and eyes	2" long
4 Corner braces	2 1/2" x 1/2"

Equipment:

Yellow carpenter's glue
Heavy-duty stapler
Screwdriver
Drill with several bits including 1-inch hole screw or largest drill bit available

Cutting directions:

1. Cut two 1" x 3" pieces into four 48" lengths. Cut remaining 1" x 3" into four 22" lengths.
2. Cut one 1" x 2" into two 43" lengths. Cut remaining 1" x 2" into two 22" lengths.
3. Cut remaining length of 1" x 2" into four equal lengths approximately 13" long.

Upper frame and lower frame (make 2 frame structures):

1. Drill 6–8 1" diameter holes into two 1" x 3" x 22" lengths.
2. Form a rectangular frame with two 1" x 3" x 48" pieces and two 1" x 3" x 22" pieces (use one with holes and one without, see drawing). Place the 22" pieces on the inside when forming the frame. Attach, using the 1" drywall screws.
3. Staple a piece of screen over the holes on one end of the frame (Fig 1).

Lower frame:

1. Attach the plywood to the frame, using drywall screws.
2. Attach the four short pieces of 1" x 2" wood to the bottom of the lower frame along the inside edge (two on each side) using 1 1/2" screws. This will hold the screen off the bottom of the dryer (Fig 2).
3. Attach the 5 3/4" door pull to the outside of one long side (Fig 3).

Upper frame:

1. Drill 12 evenly spaced holes around the outside edge of the plexiglass. Mark the placement of the holes before drilling. Attach to the frame, using the pan-head screws. To avoid cracking the plexiglass, tighten only until screws are secure.

Frame for drying screen:

1. Form the drying frame with 1" x 2" x 43" and 1" x 2" x 22" pieces. Place the 22" pieces on the outside of the frame (see drawing) and glue together at the corners. Attach the corner braces with 1" drywall screws.
2. Staple the screen onto the frame, pulling the screen tight over the frame (Fig 4).
3. Attach the 4 7/8" door pull on the top side of one short end of the screen frame. The screen should sit tight inside the dryer (Fig 5).

Final assembly:

1. Set the upper frame on top of the lower frame. To allow for adequate air flow, place the ends with holes opposite each other (see drawing).
2. Attach the frames together with hinges on the side opposite the door pull (Fig 6).
3. Attach the hook and eyes approximately 6 inches on each side of the door pull.

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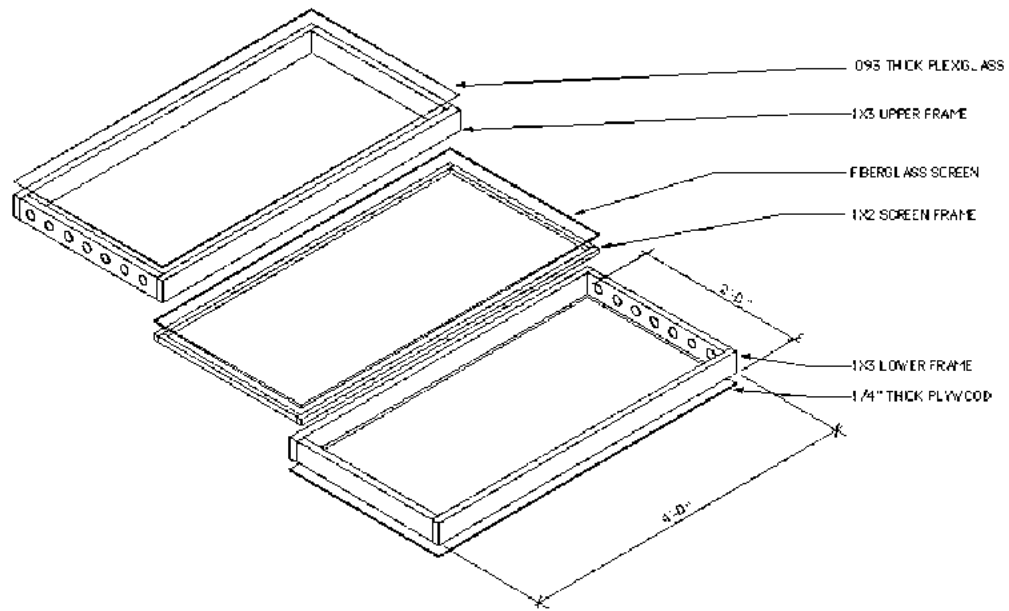
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Solar dryer computer-aided-drawing by Dean Isham, associate professor, College of Family and Consumer Sciences



Figure 1. Holes for air flow.

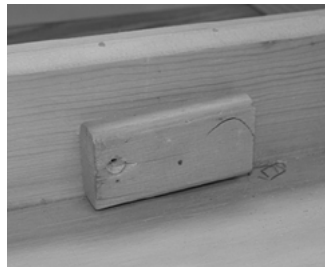


Figure 2. Screen brace.



Figure 3. Handle placement.



Figure 4. Attachment of screen to frame.

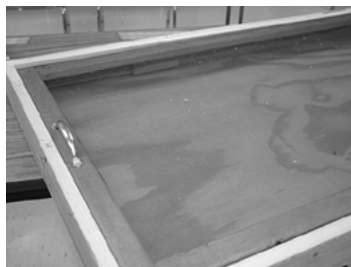


Figure 5. Handle for drying screen.



Figure 6. Hinge placement.