

How to Construct a Cold Frame or Hotbed

Cold frames and hotbeds are used to germinate flower and vegetable seeds of cool season crops in the early spring and to harden off plants prior to transplanting outdoors. The early spring start allows flowering annuals and vegetables to mature sooner than normal. Both can be constructed easily with little investment. The primary difference between a cold frame and a hotbed is that a cold frame relies on solar heating, whereas a hotbed uses an additional heat source, such as electric heating cables or fresh manure.

Choose a site

Both cold frames and hotbeds should be located on well-drained soils that don't flood during heavy rains. A site with a southern exposure is the best location for a cold frame or hotbed. A southern exposure provides maximum sunlight and heating capacity. To reduce heat loss, position the north end of the structure near a home, garage, or fence. For convenience, a nearby water source is helpful. An electric outlet may be necessary as a power source for a hotbed.

Gather materials

Many of the materials needed for cold frames and hotbeds are inexpensive and easy to find.

• Frame

Most cold frames and hotbeds are made from wood. Although treated lumber will last longer, wood treated with creosote or pentachlorophenol should be avoided. Untreated wood can be painted to reduce decay from contact with soil; white latex is commonly used because it also reflects light. However, the inside walls could be painted black which absorbs radiation and radiates heat back into the structure.

More permanent frames can be made from poured concrete, masonry blocks, or bricks.

• Transparent cover

An old glass window sash, 3 feet x 6 feet, makes an excellent cover. A clear, unbreakable cover can be made from plastic sheets or fiberglass panels.

• Heat source

Hotbeds are normally heated with electric cables or fresh manure. Electric heating cables offer more precise temperature control. They should be insulated, labeled for outdoor use, and have a thermostat control. Using fresh manure conserves energy because the decomposition process produces supplemental heat. However, food safety may be a concern when using fresh manure.

A thermometer is necessary for monitoring the temperature inside the frame.

• Sand or pea gravel and hardware cloth

If electric cables are used, sand will be needed above and below the cables. Hardware cloth will help protect the cables from possible damage when digging or planting.

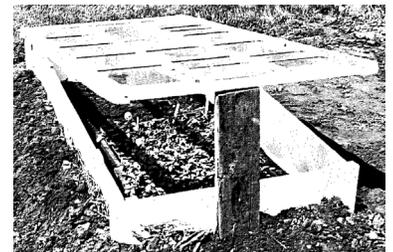
• Insulation

Straw or manure can be used to help insulate the sides of the frame.

• Optional: hinges, eye hooks

Hinging the back of the cover to the frame allows for easy access and also simplifies opening for ventilation.

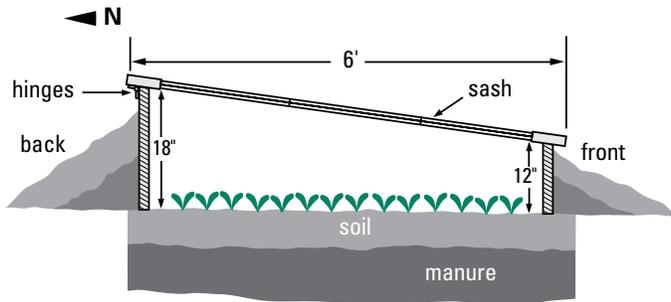
For seasonal use, eye-hooks can be used to connect the sides of a wooden frame so that it can be easily assembled or dismantled.



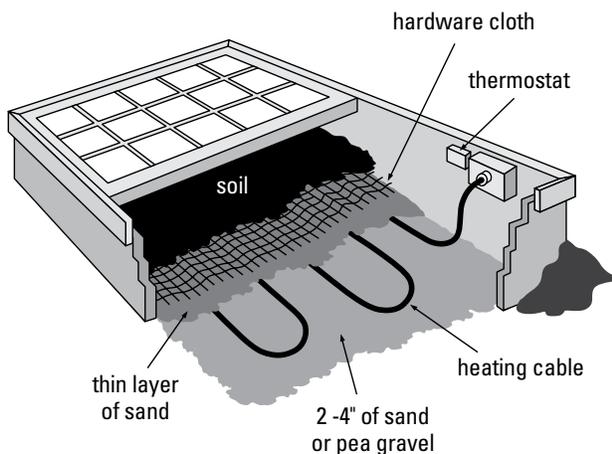
Begin construction

Determine the desired size of the finished cold frame or hotbed, then remove the soil to a depth of 1 foot in an area that is 1 foot larger than the dimensions of the frame.

For a manure hotbed—Spread 6 to 8 inches of fresh manure in the bottom of the excavated pit. Cover with 4 to 6 inches of garden soil.



For a cable-heated hotbed—Spread 2 to 4 inches of sand or pea gravel across the bottom of the excavated pit. Arrange the cables on top in a series of long loops about 4 to 6 inches apart. Cover with a thin layer of sand followed by the hardware cloth. Add 4 to 6 inches of garden soil.



Build the frame so that the front is about 12 inches high and the back is about 18 inches high. This slope allows more spring sunlight to enter the protected area.

Bank manure or straw against the outside walls and cover with soil. This will protect the frame from the weather and also aid in retaining heat.

Using the frame

Temperature and ventilation must be controlled to avoid overheating plants. Use a thermometer to determine when to open the cover for ventilation. The sash should be raised when the air temperature inside the cold frame or hotbed rises above 85°F.

It should be closed before sunset to retain heat. Cool-season crops, such as cabbage, cauliflower, and broccoli, do well at daytime temperatures between 50° and 60°F. Most warm-season flowers and vegetables grow best at daytime temperatures between 65° and 75°F.

For more information

Additional information about vegetable gardening and other horticultural topics is available from local extension offices and from these Web sites:

ISU Extension Distribution Center
store.extension.iastate.edu/

ISU Extension Horticulture—
www.yardandgarden.extension.iastate.edu

Revised by Cindy Haynes and Richard Jauron, extension horticulturists; and Diane Nelson, extension communication specialist. Illustrations by Jane Lenahan, extension graphic designer. Originally prepared by Linda Naeve, former extension associate, and Henry G. Taber, extension horticulturist.

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