

DEPARTMENT OF THE INTERIOR

BUREAU OF EDUCATION, WASHINGTON

HOTBEDS AND COLDFRAMES FOR HOME GARDENS

All teachers of home gardening should be able to help children construct hotbeds and coldframes. Even small back-yard gardens may be made much more profitable and interesting if frames are used to lengthen the growing season. By the use of a hotbed, plants may be started from four to six weeks earlier than in the open ground, and a start of from two to four weeks may be made by the use of coldframes. Early vegetables always bring higher prices. Glass covers may also be used to lengthen the season in the fall, and even in the Northern States lettuce, radishes, and similar crops may be kept growing in coldframes until Thanksgiving and often until the Christmas holidays. By protecting seedlings early in the season, crops may be grown for which the growing period in a given locality is otherwise too short. The use of frames will make it possible to increase by several months the period of out-of-door activity of children making gardens. Fresh vegetables may be produced at a season when the home is unable to get them or the high prices make their use prohibitive. If all the children can not have hotbeds, a few of the older boys will find it profitable to supply plants to the other children at low prices.

LOCATION OF THE HOTBED.

The hotbed should be placed on a well-drained spot at one end or at the side of the garden, where it will be least in the way of other garden activities.¹ A good location is 3 feet from the fence on the north side or direction from which the prevailing wind strikes the garden. If this fence is made of wire, boards should be nailed to the posts to serve as a shelter. Very often it will be found more convenient to place the hotbed wholly outside of the garden. If there is room on the south or southeast side of the house it will provide an excellent site. It is important, however, to place the frame at least 4 feet from the building, so that water from the eaves may not fall on it, and also that there may be ample room for the operator to work from the side nearest the building.

¹ For plan of placing hotbeds and coldframes in the garden, see Bulletin U. S. Dept. of Agriculture No. 252, figs. 1-2; No. 647, figs. 1-2.

MAKING THE HOTBED.

FALL WORK.

As soon as the location of the hotbed has been selected, its size should be considered. This decision will be governed by the size of the sash on hand. The children should be urged to look in the basement, attic, and shed for old window sash, or see if storm windows can not be pressed into service. If this search does not reveal suitable cover, and sash must be purchased, it may be bought in two sizes—3 by 6 feet (standard sash) or 3 by 3 feet (pony or junior sash). For the use of graded school children the smaller size is preferable, as it is easier to lift, and all of the plants grown under it may be reached without stepping into the bed.

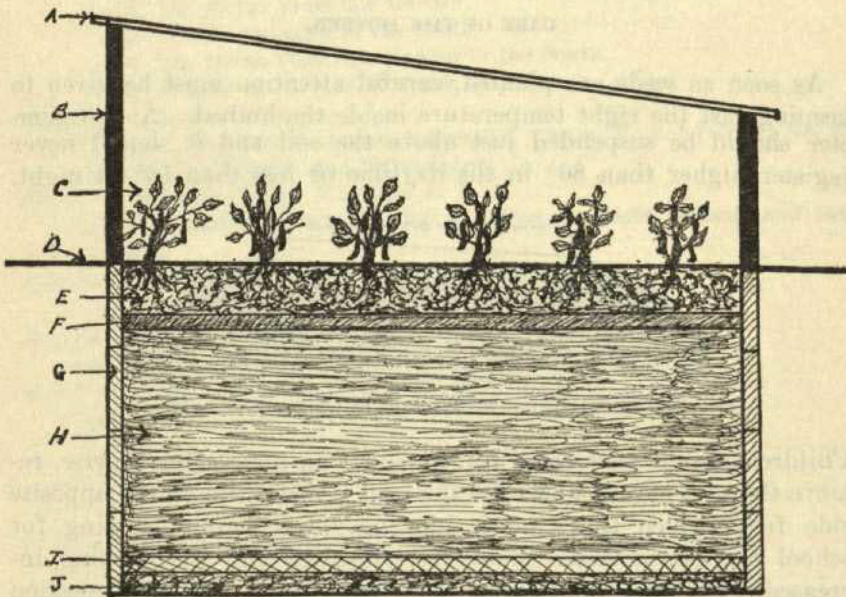
The pit for the sash should be dug before the ground freezes in the fall. It should be 30 inches deep, and just as long and wide as the sash will cover. This pit should be lined with wood, using 2-inch plank, if possible, but boards found in the yard or taken from heavy packing boxes will be fairly satisfactory. Special care should be taken to have this lining level at the surface of the ground. The next step is the construction of a top frame, which should be 16 inches high at the back (north) and 8 inches in front for standard sash or large storm windows, and 12 inches in the back and 6 inches in the front for pony or half-window sash. If more than one sash is to be used, strips of board 4 inches wide should be nailed from front to back in the top frame at the point where two sashes meet. The top frame must be so made that it will exactly fit on the pit frame. As soon as the top frame is in place fill the whole pit with dry straw or leaves and cover with boards to keep out frost, snow, and ice.

As the ground will be frozen when it is time to plant the hotbed, planting soil should be obtained in the fall. By mixing thoroughly one-half good garden loam and one-half well-rotted manure, and placing in a box in the basement, the soil will be ready as early as it is needed in the spring. This soil needs to be kept moist throughout the winter.

SPRING WORK.

When the planting season is from four to six weeks away, enough fresh horse manure should be obtained to fill the pit 24 inches deep. Somewhat less manure may be used in the Southern States. This manure should be piled for a few days and forked over at least once. The boards and straw should then be removed and 2 or 3 inches of fine stones or coal ashes placed in the bottom of the pit, and 3 or 4 inches of straw or leaves covered over it, so that the manure may

not come in contact with the cold ground and good drainage may be assured. The manure should then be packed into the pit in layers 6 or 8 inches thick, each layer being tramped down thoroughly. The manure should contain enough straw to make it "springy under foot." Over the manure 2 or 3 inches of straw should be placed, and over this 6 inches of planting soil. (Fig. 1). The sash should then be put in place, but planting should not be done at once, as the fermentation of the manure will cause too much heat for a few days. The bulb of a thermometer may be buried in the soil, and when the temperature has fallen to between 75 and 80 degrees it is time to put in the seed.



Hot Bed.

FIG. 1.—A, sash; B, frame; C, plants; D, ground level; E, well-prepared soil; F, thin layer of straw; G, boards in pit; H, manure; I, leaves or rough litter; J, drainage, rough stones or ashes. (Illustration furnished through courtesy of Rhode Island State College.)

In case the pit was not prepared before the ground froze in the fall, it is still possible to have a hotbed, but the method of making is more costly and not as satisfactory. To make this bed (fig. 2), fresh horse manure should be obtained and forked over as before; it will need to be a larger amount than before. The manure should be spread directly on the frozen ground and tramped into a flat-topped pile 24 to 30 inches deep and at least 1 foot wider and longer than the sash to be used. The top frame should be placed on the manure and straw and planting soil put on as directed above. More heat will be retained by banking the manure on the outside as high as the top of the frame.

HOW AND WHAT TO PLANT.

The seeds of most plants grown in the hotbed are small and should be planted in rows 3 inches apart, $\frac{1}{2}$ to 1 inch between seeds, and about $\frac{1}{4}$ inch deep. The trench for the seeds can be made by pressing the edge of a $\frac{1}{2}$ -inch board into the soil. As soon as the seeds have germinated and the seedlings have three leaves, they should be transplanted to 4 inches apart in another part of the hotbed. Long season crops, such as tomatoes, eggplant, peppers, cabbage, should be planted in the hotbed in order to give them an early start. Plants that grow tall should be planted at the back of the frame.

CARE OF THE HOTBED.

As soon as seeds are planted, careful attention must be given to keeping just the right temperature inside the hotbed. A thermometer should be suspended just above the soil and it should never register higher than 80° in the daytime or less than 55° at night.

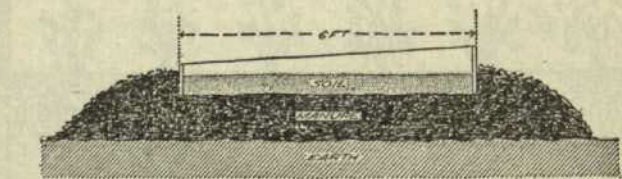


FIG. 2.—Cross section of hotbed made of top frame and manure.

Children should visit their frames about an hour after sunrise, remove the sash covers, and raise the sash a very little on the opposite side from which the wind is blowing. Just before starting for school the thermometer should be consulted and the opening increased if the sun gives promise of a warm day. Another inspection should be made at noon, and the ventilation should be governed by the temperature registered by the thermometer. When moisture gathers on the underside of the glass more ventilation needs to be given. At sunset the sash should be completely closed and the whole top covered with old mats or burlap sacks, boards being laid on the covers, so that they will not be blown away. Plants in a hotbed should be watered about as house plants are watered, not a slight sprinkling every day, but a thorough watering early in the morning when needed. The soil should be examined carefully; when it begins to dry out below the surface layer it is time to water again.

COLDFRAMES.

Work with the coldframes is much like that with the hotbed except that the coldframe is easier to build, and since it is started later in the season it is not as hard to control the temperature for it.

A pit with manure or other heating material is not necessary. The top frame and sash are placed directly on the ground and 4 inches of planting soil are put in for a seed bed. Coldframes are used for hardening off plants that are beginning to crowd each other in the hotbed. In the extreme Southern States the coldframe takes the place of the hotbed, and muslin is often substituted for sash, but in most States both coldframes and hotbeds can be used with profit.

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