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HOT BEDS AND COLD FRAMES

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Early gardens, as a rule, are the most profitable. Therefore any factor which assists in making an early garden is very desirable. It is especially important to have good, strong, healthy tomato, pepper and eggplants to set out in the open ground as soon as danger of frost is past.

The complaint is quite general that "my tomato plants grow well, but all the blossoms fall off without setting fruit". Those who have observed closely have no doubt noticed that sometimes an early crop or a late crop of tomatoes, pepper and eggplants are produced, but fruit of the above plants are not available during the summer. One way of lessening this trouble is to have good sized, healthy, stocky plants to set out at the proper time. In this way the plants will set fruit before the unfavorable conditions set in and the fruit will ripen during the summer. The best way to get these plants is by starting the seed in a hotbed and transplanting them into a coldframe. Again, there are some plants, such as lettuce, cabbage, cauliflower, etc., which require cool, moist conditions for their best development. By starting plants early they will mature before the hot, dry weather begins. Hotbeds are also used to mature plants, such as lettuce, radishes, green onions, etc., for winter use.

In many localities it is next to impossible to secure first-class vegetable plants of the best varieties when desired.

Location of Hotbed.—The location of a hotbed should be (1) well drained, (2) exposed to the sun throughout the day, (3) protected from the north winds, (4) sloping to the south.

By being located relatively high, better exposure and drainage are secured. By being located on the south side of a building, and attached to the building, if practicable, building material is saved, the reflected heat is taken advantage of, and protection from the north winds is secured. The south side of a board fence or hedgerow is frequently chosen. If there be a choice between locations, nearness to the water supply should be considered.

Cover.—Regular hotbed sash, which is usually 6 feet long and 3 feet wide, is preferable for the cover. Hotbed sash properly cared for will last almost one's lifetime. They afford better protection to the plants than canvas covering, give better light, and trap the heat from the sun. In the long run, hotbed sashes are cheaper than canvas. Sashes glazed with three rows of glass are good, as they admit plenty of light and at the same time are not very easily broken in handling. For a small hotbed, where only a few plants for home use are desired, a windowsash may be used. The only modification to be made in windowsash would be to cut down the cross-bars of the sash flush with the glass so the water would run off.

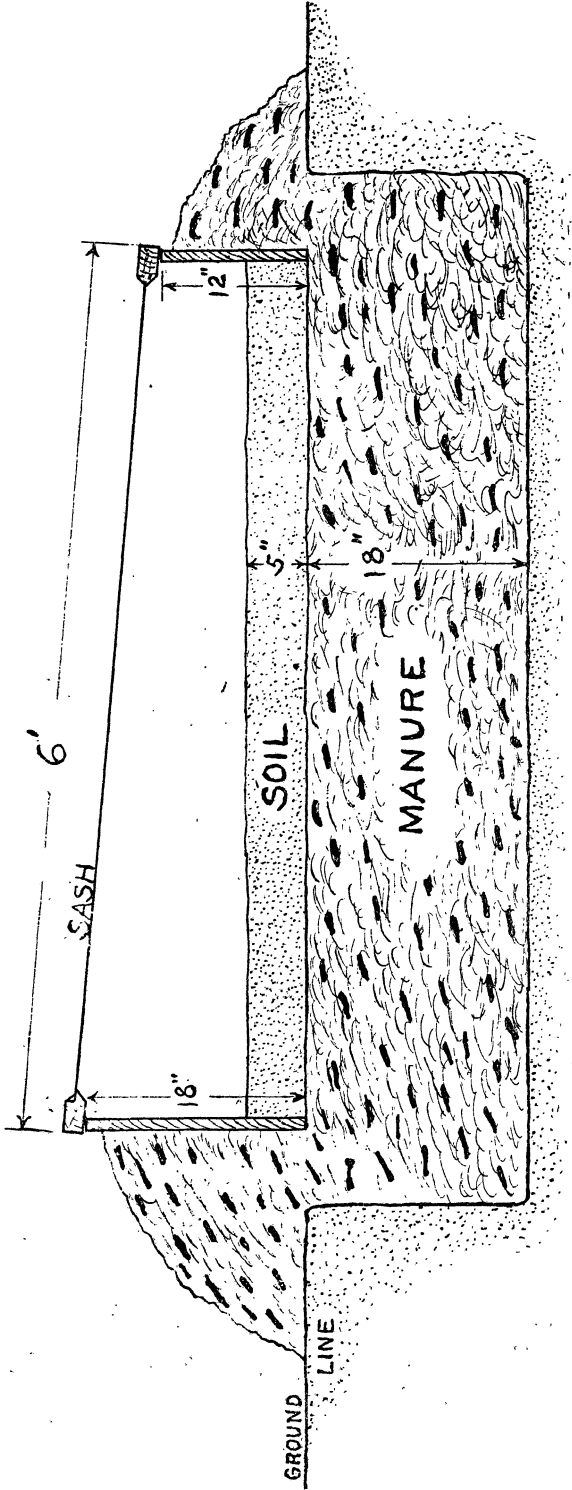


Figure 1—Cross-Section of Hotbed

Frame.—Where the hotbed is to be covered with the regular hotbed sash, 6×3 feet, the frame should be 5 feet 11 inches wide, and a multiple of 3 feet long. In case of a two-sash frame, which is a good size for the average home garden, it would be 6 feet long, etc. The back or north side of the frame should be 18 inches tall and the front or south side 12 inches tall. Cloth-covered frames are, as a rule, narrower than those covered by the 6×3-foot glass sash. The frame should always be so constructed that the pitch from the back to the front will be sufficient to shed the water.

Pit.—The pit should be dug about 18 inches deep, the width and length depending on the size of the frame. Assuming that we are going to have a two-sash (6×3 feet each) frame, the pit should be 8 feet long, 7 to 8 feet wide and 18 inches deep. When the frame is placed on the manure, the manure will extend beyond the boundaries of the frame (see Figure 1—Cross-section of hotbed). By banking manure around the outer edges of the frame the temperature will be practically the same in all parts of the frame.

Manure.—Use fresh horse manure which contains one-fourth part of straw or other litter. Fresh horse manure gives off an even temperature. The straw is necessary so the air can get into the manure, thereby causing the rotting which produces the heat. The preparation of the manure should begin about ten to twelve days before you expect to plant the hotbed. Pile the manure near the pit. In case the manure is dry, moisten it, preferably with warm water. Moistening the manure with warm water is especially important in case of a small pile. In case of a small hotbed, say a one-sash frame, when only a small amount of manure is necessary for the pit, it is usually necessary to begin with more manure than is necessary in order to get it properly heated. Pile the manure in fairly firm piles, otherwise it may not heat. Usually two or three days are required for the manure to heat. Repile the manure when heated, placing the inside of the pile on the outside. If dry, moisten again. In two or three days the manure should be ready for the pit. Place the manure in the pit, packing it in layers as placed in. Firm the corners and edges well. Fill the pit level with the surface of the soil. Sometimes the pit is only filled with manure to within five inches of the surface of the soil, and then a 5-inch layer of soil is added.

Placing the Frame

Place the frame on the manure and bank manure around the frame. Add a 5-inch layer of good hotbed soil inside the frame. A good hotbed soil may be made of 1 part sand, 1 part well-rotted manure and 2 parts of garden loam soil.

Water the soil and place on the cover. The temperature in the frame is apt to run up very high for several days. On account of the moisture and heat many weed seedlings may be destroyed. When the temperature declines to about 90° F. the hotbed is ready to plant. From the above it is seen that a hotbed should be started about two weeks previous to planting date.

Additional Protection.—When very cold weather prevails during the regular hotbed season, additional protection may be necessary. In such cases old comforts, quilts, straw mats or building paper tacked on wooden frames may be used.

Seeding.—Where it is desired to mature vegetables in a hotbed such as radishes, etc., the seeding date would depend on when you desired the plants for use. In case of tomato, pepper and eggplants the seeding date would depend on when you expected to transplant them to a cold frame and also on how close together you planted the rows and how thickly the seed are planted in the row. First, we will assume that the plants are to be

transferred directly to the open garden. In this case plant the seed rather thinly in rows six inches apart about six weeks before danger of frost is past. When danger of frost is past, by April 20, plant the seed March 6. After the plants are up and well started, begin hardening them off by exposing them to a cooler temperature by increased ventilation.

In case the plants are to be transplanted to a coldframe, plant the seed from the 15th to the 25th of February. The seed of cabbage, cauliflower and lettuce when started in a hotbed should be planted in the hotbed from the middle to the last of January. However, it is preferable to plant the seed of these plants in the cold frame in October, and winter the plants over in the cold frame as described in Circular No. 68, published by the Extension Division of the Oklahoma A. and M. College. (This circular can be had free upon request). Sweet potatoes are usually bedded from the 15th to the 25th of March for the production of early plants.

Watering and Ventilating.—Water the bed when the seeds are planted and water afterward whenever the bed becomes dry. Water thoroughly when watering. The frequency will depend on the season of the year, the amount of sunshine during the day, the size and vigor of the plants. Do not keep the bed too wet or the plants may damp (rot) off. When the top surface of soil gets dry, then water. Water the hotbed in the morning and not evening. Warm water during cold weather is preferable.

More care is necessary in ventilating a glass covered hotbed than a canvas covered bed. Usually when the sun comes out a glass covered bed will require ventilation. The temperature inside the frame for tender plants such as tomato, pepper and egg plants should run from 60 at night to about 80° F. in daytime, and the cold-natured plants, such as cabbage, 10° to 15° less. Ventilation is secured by means of raising the sash at one end, opposite from the wind, partially or entirely.

Flue Heated Hotbeds

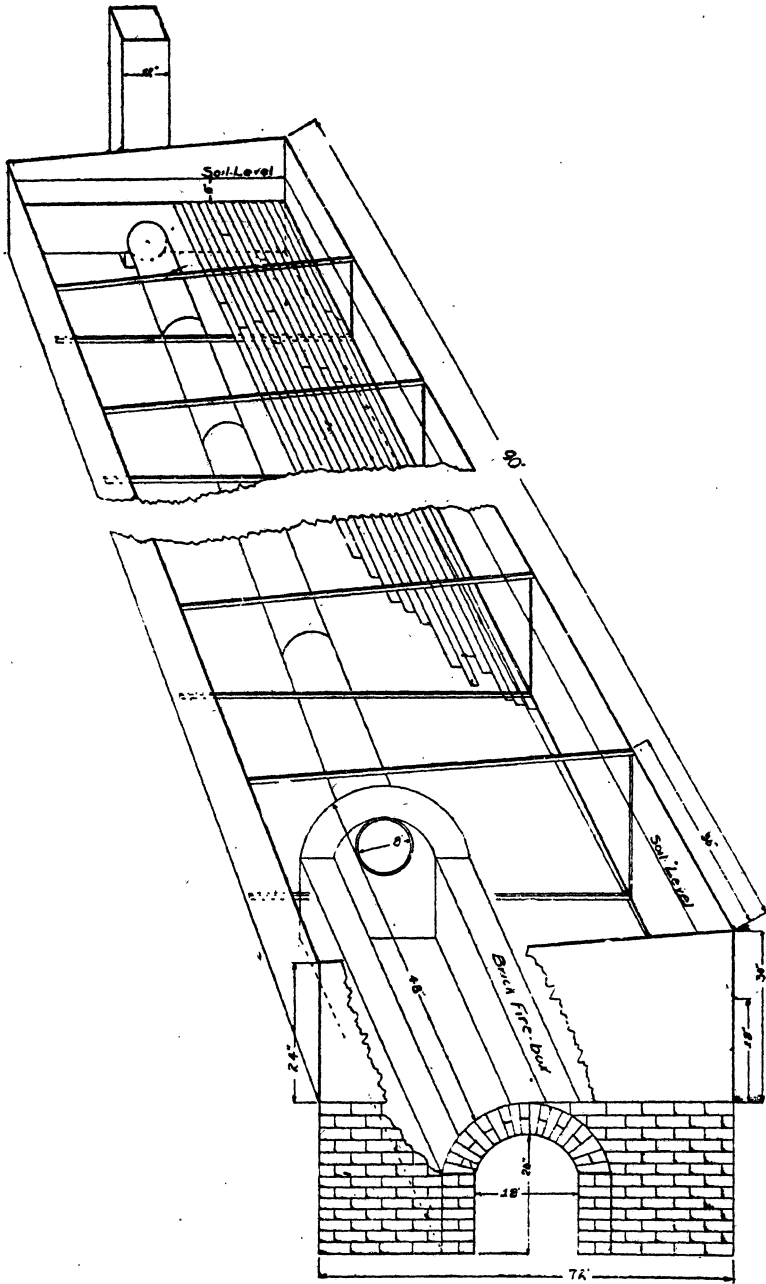
On account of scarcity of manure and economy in constructing, flue-heated hotbeds are becoming more common, especially with the sweet potato growers.

There is a great variety of material used in the construction of the flues, some using wood, others stovepipe, brick and tile, while some use a dirt tunnel covered with boards. In brief, the flue, in whatever form, extends from a firebox at one end through the center of the bed and into a flue of some type at the opposite end. Whatever type is used, care in construction at the firebox end to prevent burning or excessive heat is necessary. A flue-heated hotbed requires, as a rule, a large amount of water.

The following description and cut of a flue-heated hotbed is taken from Circular No. 15, Alabama Extension Service and represents a good type. In Figure 2 is shown how one of these frames may be constructed. When possible, the frame is placed on a slight slope with the firebox at the lower end, thus giving the necessary slope to the floor.

The firebox is constructed of brick and should be arched. The dimensions, as given in drawing, are 18 inches wide (inside measurement), 20 inches high and 4 feet 8 inches long. The terra cotta flue pipe leading under the bed is 8 inches in diameter, and should extend the entire length of the frame into the chimney at the other end. The first two or three joints of the flue should be covered with brick, as the blaze from the fire might cause it to become too hot and endanger the floor. The chimney may be made of brick, or by nailing together four 12-inch boards in box fashion. The chimney should be larger than the flue under the floor as it will draw better.

The wooden floor should be built at least four inches above the flue, so as not to catch fire and to give better distribution of heat. The floor should



A FLUE-HEATED HOT BED
Figure 2

have a slope of 1 inch to $7\frac{1}{2}$ feet, or 12 inches in 90 feet. That is, the soil at the furnace end should be 18 inches deep and at the chimney end 6 inches deep. The flue under the floor should have the same slope as the floor. The soil on top of the frame should be level. Any kind of rough boards may be used as flooring.

As shown in the drawing, the frame should slope toward the sun, and should be 6 inches higher on the back than on the front side. The top of the frame should be level from east to west.

Coldframes

A coldframe is constructed the same as a hotbed, except the pit and manure are omitted. In other words, the coldframe has no bottom or artificial heat. The coldframe is more frequently covered with cloth than the hotbed.

Uses.—The coldframe is used to winter over semi-hardy plants, such as cabbage, cauliflower, lettuce and onions. Seed of these plants are planted in the coldframe about the 10th of October and wintered over, thus producing what is commonly called frost-proof plants. In this location (Payne county) the above plants may be safely transplanted to the open ground from the 20th of February to March 10.

Thus it is readily seen that the same frame used for the coldframe would be available for the family hotbed. Coldframes are also used for hardening off hotbed seedlings, as referred to in a previous part of this circular.

When large, stocky coldframe tomato plants are desired, say 8 to 12 inches tall, diameter the size of the finger, and with blossoms, the plants

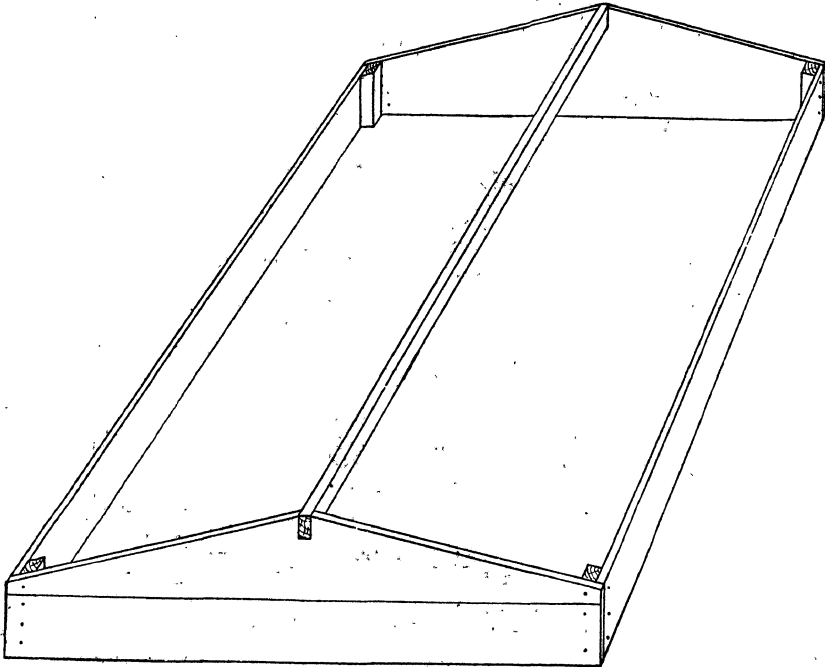


Figure 3—Double Coldframe

may be set in the coldframe six to eight weeks previous to date of transplanting in the open ground. In this case the plants are usually transplanted 4 inches apart each way in the coldframe. Transplanting bands are frequently used in which to set the plants in the coldframe.

Where a large amount of coldframe room is desired it is more economical of building material to construct a double coldframe, run it north and south, thus facing the east and west. (See Figure 3.)

Location.—Small coldframes are usually located similarly to the hotbed. In case of long double coldframes, they are usually located near the planting ground. However, due consideration should be given the source of water and convenience of looking after them.

Transplanting.—In transplanting plants from the hotbed or coldframe it is desirable to water the plants several hours previous to the time of transplanting in order to remove the plants without injuring or destroying the roots any more than necessary. Do not expose the roots to the wind or sun any more than is absolutely necessary. In replanting, make the hole large enough to receive the roots and then firm the soil well about them. As a rule, vegetable plants may be reset deeper than they originally stood. In this way less of the plant is exposed to evaporation, and again a deeper root system is established which will better enable it to stand dry weather.

In case of an excessively large amount of foliage, a part of same should be removed when transplanted. If watering is necessary, set the plants and partially fill the opening with soil and then firm it. Fill the remaining opening with water. Permit the water to soak in and then finish filling the opening with loose soil and leave it loose to afford a mulch.

