Hotbeds and Coldframes
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HOTBEDS AND COLDFRAMES

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HOTBEDS AND COLDFRAMES

THEIR USE, LOCATION, CONSTRUCTION, PREPARATION AND CARE

HOTBEDS

Use: A hotbed can be made an important part of any home garden. A properly constructed and well managed hotbed can be used to grow such crops as lettuce and radishes to maturity early in the season, thus providing them for the table sooner than they could be secured if grown in the open ground. Hotbeds are also used very commonly in which to start and grow plants to be set in the garden or field. They can frequently be used to good advantage for the growing of certain crops late in the season, and by making use of the protection which they afford, fresh vegetables may be supplied for the table after the outdoor crops have been killed by frost. In some sections of the state such crops as melons, cucumbers and tomatoes are started in hotbeds before the weather will permit outside planting. As soon as frost danger is over the sash are removed and the crops allowed to mature in the frames.

Location: The hotbed should be built in a location which will be convenient to the house and garden and which will afford protection from cold north and west winds. A south or southeastern exposure is to be preferred. An abundant water supply is important. Good surface and under ground drainage is also essential.

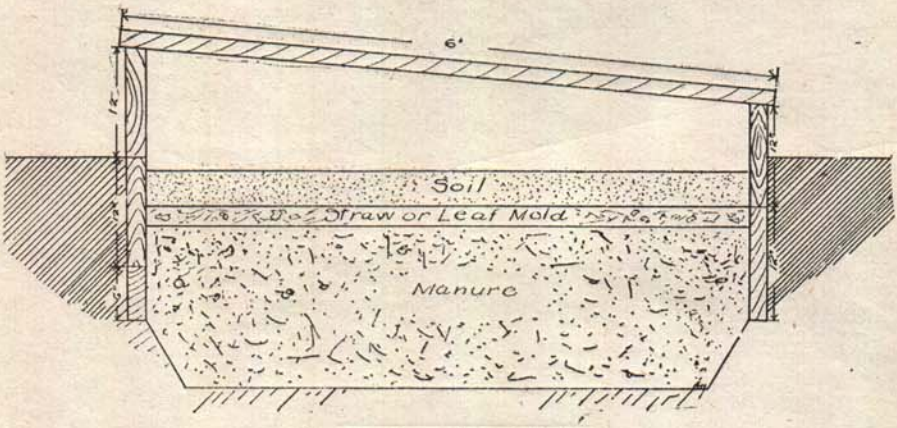

Figure 1. Crossection of a hotbed

Construction: A hotbed is a box-like structure covered with glazed sash and artificially heated. The most common width for the frame is about six feet outside measurements. The standard size for the sash is three by six feet. There is, however, no serious objection to the use of other widths of frames, nor sizes of sash. It is frequently possible to make use of odd sizes of sash or glass, and where only a small hotbed is needed, as is the case in connection with most home gardens, this will be no great disadvantage.

The frame should, however, be built to accommodate a definite number of sash of the size to be used.

For a farmer's garden or a town or city garden of large size, a three or four sash hotbed would be a suitable size to use. A one or two sash hotbed will answer the purpose very well when the garden is small. The frame for the hotbed may be made of wood or concrete. If of wood, only that which is durable should be used. A concrete frame is the most lasting if properly made. It is a good plan to attach a 2 x 4 to the top of the frame as the sash will usually fit closer and work easier on the wood than on concrete. Then too, it is often necessary to kneel or sit on the edge of the frame and cement is not suitable for this purpose.

Figure 2. Lifting the sash to water the plants in the hotbed.

The most simple form of hotbed is one made, by placing a sash covered frame on top of a flat pile of fermenting manure. The permanent structure, however, is the form most commonly used. A practicable and permanent wooden hotbed can be made with two twelve inch planks on the south side and two twelve inch and one six inch on the north side. This will make the north side of the frame six inches higher than the south side and thus provide a satisfactory slope for the sash. About one foot of the back of the frame and six inches of the front should be above ground. The pit in which the manure is placed should be from two and one-half to three feet below the surface. This will permit the use of from eighteen inches to two feet of manure, two inches of straw or leaf mold to distribute the heat, and four to six inches of good garden soil, and also give room for the plants between the surface of the soil and the sash.

The posts should be made of 2 x 4, durable timber. If twelve foot plank are used posts should be driven at each corner and one on each side midway

between the corners. Two by fours or pieces of similar weight should also be placed across the frame at the junction and edges of the sash. The cross bars should be mortised in on the sides flush with the top. If there is any trouble about the sash sliding down too far, a piece of board four inches wide can be securely fastened on the lower end of the cross bar, it being allowed to extend an inch or so above the bar. The frame should be so constructed that the sash will extend over a half inch at either end of the sash. Precautions should be taken to have the sash tight enough, but not too tight to work freely.

Hotbed sash should be made from sound material. Lumber which will plane to $1\frac{3}{8}$ inches makes a satisfactory thickness for the sash.

When purchasing sash inquiry should be made about the material used and manner of putting together. The joints should always be leaded to make a tight sash and to prevent decay. A light rod fastened across the sash at the center will give strength and prevent spreading.

The sash should be primed before the glazing is done. Only "A" quality glass should be used, as the cheaper grades will often cause the sun's rays to burn the leaves of the plants. Double strength glass will be the most durable, especially in sections where hailstorms are of frequent occurrence. Ten by twelve inch glass fit nicely in three by six feet sash requiring 18 panes to each sash. The glass should be lapped and will make the tightest sash if it is imbedded in putty. After glazing, the sash should receive at least one more coat of paint. They should be stored under cover when not in use.

Double glass sash have some advantages over the single glass sash, but because of their extra weight and greater cost are not used very commonly.

Preparation: Horse manure from grain fed animals containing one part litter to two parts excrement makes the most desirable and economical heating material for hotbeds. The manure should be fresh, as that which has been exposed to the rains for a considerable length of time or which has been kept in a pile and has become "fired" will not produce the required amount of heat. When the manure is taken directly from the stable, it should be piled in a compact heap. If the amount of straw or litter is too limited more can be added. Forest leaves make good litter, but shavings are not suitable. As soon as fermentation begins freely after piling, the manure should be repiled, placing that which was on the outside on the inside of the new pile and vice versa.

The preparation of the manure should begin at least ten days before the hotbed will be wanted for seed sowing. Some form of protection from rains and excessively cold weather is essential for the best results. Manure which has stood in a pile for a few days may have begun fermentation before the preparation for hotbed use began. Such manure should be forked over and repiled to insure an even distribution of heat.

When the entire mass of manure is steaming hot but not "firing" it is ready to be placed in the pit. It should be put in in layers and firmly tramped, especially around the edges and in the corners. Allowance should be made for the settling of the manure. As soon as the manure is in place, a layer of two inches of straw should be put on to help distribute the heat. From 4 to 6 inches of well prepared garden soil is then placed on top.

If flats are used in which to grow the plants the soil in the hotbed need not be as deep as when the seeds are sown in the hotbed soil.

As soon as the manure and soil are in place in the hotbed, the sash should be put on to protect the bed from rain or snow and to help retain the heat. In no case should seeds be sown nor plants set until the manure has had a

chance to heat freely and cool to at least 85°. The violent heating does not take place for three or four days in some cases. A temperature sufficiently high to kill weed-seeds in the soil and in the manure frequently occurs. If the manure fails to ferment after it is placed in the hotbed either it was not suitable for the purpose or it was not properly prepared.

Care: Hotbeds require careful attention in the spring when the weather is changeable and the nights frosty. The sash must be raised, slid down or removed entirely, each morning, depending on weather conditions. They must be replaced each evening. The plants must be watered when necessary and the weeds kept out. The soil between the rows should be stirred frequently. Thinning out, transplanting, and re-seeding must be resorted to at times. The watering must be done carefully and at the proper time. As a general rule, it is best to water in the morning only and on bright days when the sash can be left open to dry off the plants.

Constant vigilance and careful attention to details are essential qualities having to do with the successful handling of hotbeds. One failure to protect the plants on a frosty night will mean that the work must all be done over again or the hotbeds abandoned. But the advantages to be gained by their proper use are so many and the pleasure of securing good crops or growing early strong plants in them is so great that they are well worth their cost and effort.

COLDFRAMES

Use: Coldframes are used in much the same way as hotbeds, except that the crops grown in them are not started as early and the seeds for plants are not sown as early as in the hotbeds. They are used very generally in which to develop and harden off plants which have been grown in the greenhouse, hotbed or kitchen window.

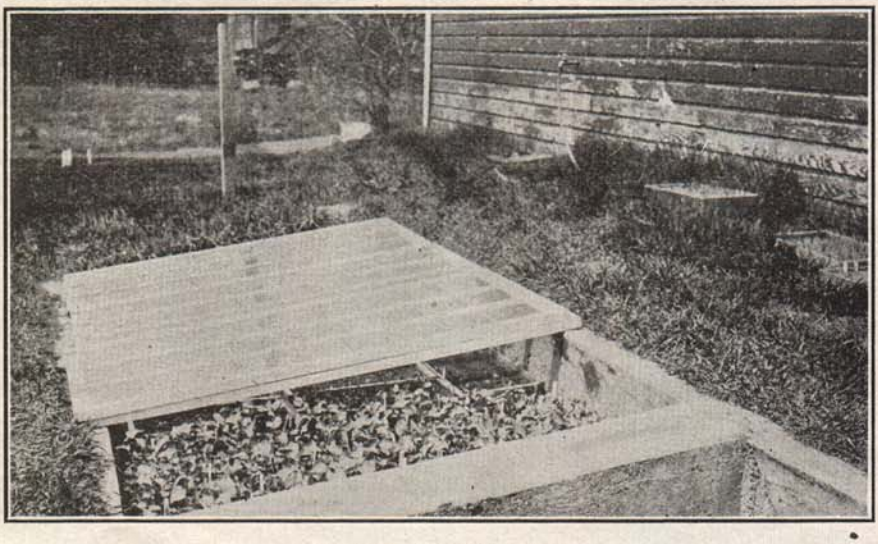

Figure 3. Concrete hotbed.

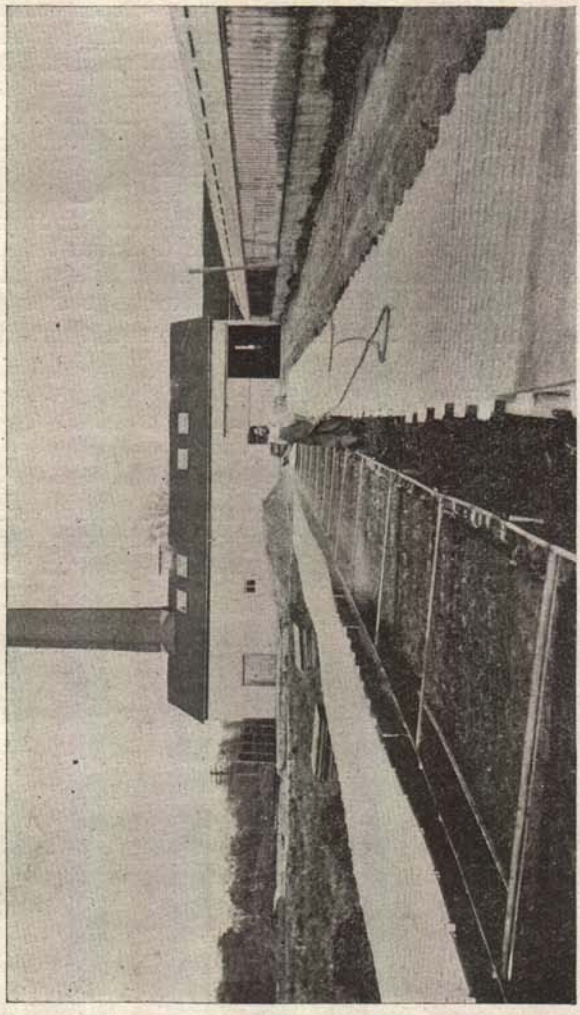

Figure 4. Commercial hotbed in which to start melon and tomato plants.

Commercially, coldframes are used more extensively than hotbeds. When used in connection with the home garden, they require less expense in the building and trouble in the preparation, and not as close attention in their operation, as hotbeds. These differences are due to the fact that the hotbeds must protect the plants from more severe weather than the coldframes. On the other hand, a coldframe will not be as satisfactory as a hotbed if early crops and early grown plants are greatly desired.

Location: The statements previously made relative to the location of the hotbed apply equally well to the coldframe.

Construction: Coldframes are built on much the same general plan as hotbeds. No manure is used to supply heat in the coldframe; therefore, little or no excavating is needed. The frames usually rest on the surface of the ground with a little soil or manure banked against the outside. Thinner boards and lighter stakes and cross bars can be used than are used in connection with hotbeds. For the home garden glazed sash are much to be preferred to cloth as a cover. When coldframes are used in which to grow plants for late crops, or to harden off plants only, cloth covers will be fairly satisfactory. If the cloth is of good quality, carefully handled and properly stored when not in use, such protectors should last two or three years.

When steam or hot water is used in a greenhouse or residence, the frames may be piped and heated from the same boiler. This method of heating is gaining in popularity among greenhouse men, but it is not usually practicable for the small frames used in connection with the home garden.

Care: Coldframes do not require as constant care as hotbeds, but for the best results they must receive considerable attention. The ventilating is perhaps of greatest importance, although the watering should never be neglected. The most common and serious trouble with frame grown plants is a fungous disease known as "damping off." This can usually be prevented by watering only on bright days and early in the day and by giving the plants an abundance of fresh air. When the sash are left in place too long, the air becomes saturated with moisture and the "damping off" fungus flourishes in such an environment.

THE COMPOST HEAP

It is very convenient to have a supply of well prepared soil available at all times for use in the hotbed or in flats or boxes in which plants are to be grown. Then too, most housewives have more or less difficulty in securing suitable soil in which to grow flowering plants either in pots in the house or in beds in the yard. A compost heap will supply this need. It may be made by plowing or spading up a quantity of bluegrass or other good turfy sod and piling it grass-side down with alternate layers of fresh stable manure. The proportion should be about one-third manure to two-thirds sod. If the soil from which the sod is taken is heavy, muck or sand should be added. Such a heap should be allowed to stand for several months, preferably over winter before it is used. After the frost is out of the heap in the spring, the soil should be cut down in thin layers with a sharp spade and repiled. It should

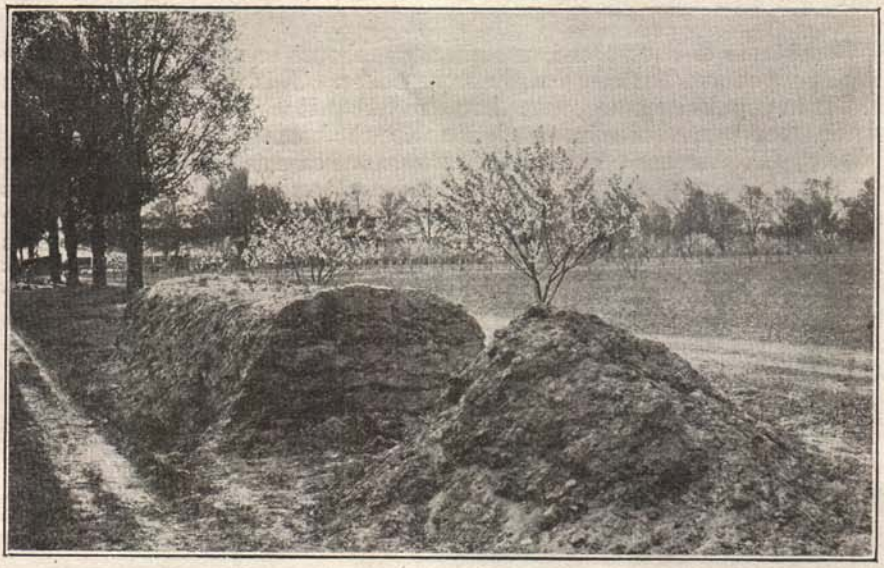

Figure 5. Compost heap.

be shoveled over once or twice more before it is used. When it is well mixed it should be run over a wire screen if the soil is to be used in which to sow seed. For small seeds, such as many kinds of flower seeds, a second sifting through a finer meshed screen will be very desirable.

When the compost heap is not available, a fairly satisfactory soil in which to grow plants can be made by mixing good garden loam with well rotted stable manure. Muck soil which has not been submerged under water for some time, will be found very satisfactory in which to grow plants of most kinds.

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