

Home Garden Hotbeds

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It is frequently necessary or desirable to start some vegetable crops under covers known as greenhouses, hotbeds, or coldframes. Hotbeds are most commonly used.

METHODS OF HEATING

Hotbeds for growing vegetable seedlings can be heated with fermenting manure, steam, hot water, hot air, or electric heating devices. The amount of heat needed depends upon the outside temperature, the construction and location of the bed, and the temperature required. Beds constructed underground

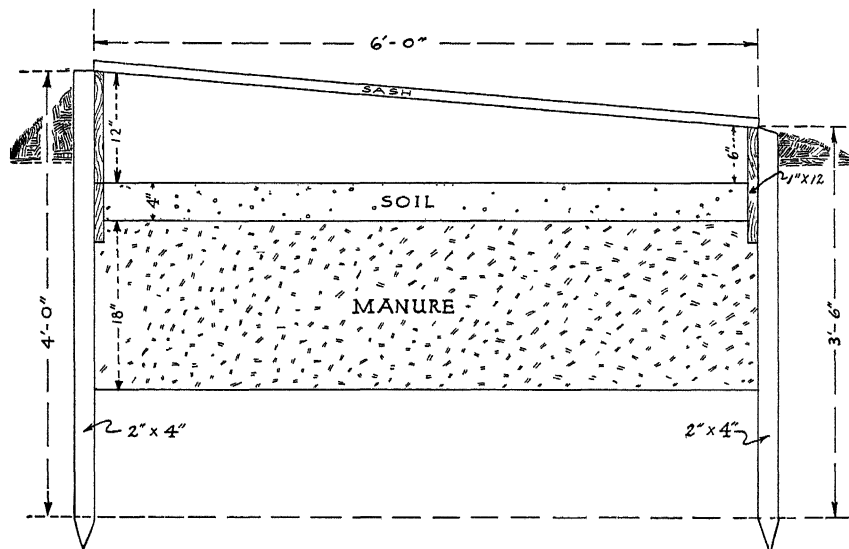


Fig. 1.—Cross section of pit style hotbed.

(pit hotbeds on well drained soil) need less heat than beds constructed on the surface. Ten to twelve inches of fresh horse manure are adequate for pit hotbeds, but 18 to 24 inches are usually required for surface beds (Fig. 1). In addition, a greater area must be covered with manure if surface beds are used.

If the hotbed is located in a pit, 25 square inches of radiating surface are required for each square foot of hotbed heated by hot water, and 18 square inches for hotbeds heated by low pressure (2 to 5 pounds) steam. Nearly double this amount is needed if surface beds are to be heated.

Sixty feet of No. 19 heating electric cable is usually adequate for a 6- by 12-foot pit hotbed, but only enough for a 6- by 6-foot surface bed (Fig. 2). If the upper surface of the frame is carefully planed so that it makes a tight fitting union with the sash covers, heat loss will be greatly reduced. Manure or straw

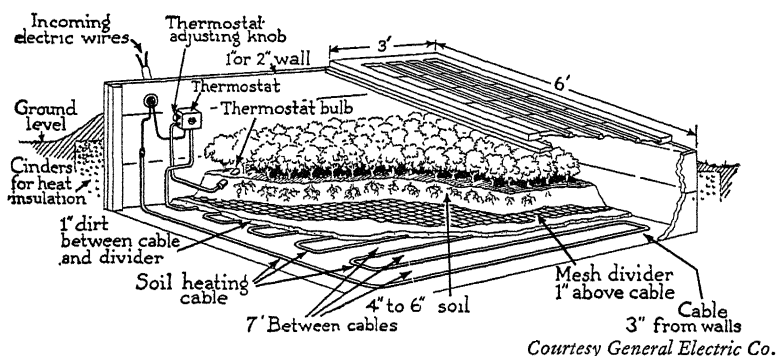


Fig. 2.—Cross section of an electrically heated hotbed, showing details of construction. Hardware cloth or wire netting is sometimes placed 1 inch above the hotbed cable to protect it from injury from spades, trowels, etc.

banked around the edges of the sash and even over the sash reduces heat loss, and protects plants against freezes during short periods of very cold weather even though the supply of heat on the inside is very meager.

Beds located against the south side of dwellings are better protected and need less heat than exposed beds.

SIZE OF BEDS

A head space of at least 6 inches should be provided above the soil for the growth of plants. In order that water will flow away freely during heavy rains, a slope of 6 inches per 6 feet of sash should be provided. Thus, 12- to 18-inch boards are usually used for the north sides, and 6- to 12-inch boards for the south sides of beds extending east and west (Fig. 1).

Beds are usually 6 feet wide and as long as needed; make sure that the ends of the frame will match the sides of the end sash, so that heat transfer will be reduced to a minimum. Sash are usually 3 feet wide.

COVERS

Glass sash are usually employed because glass admits a maximum of light, is heavy enough to weight the sash down, and the individual panes are easily repaired if they become broken.

Various forms of cellulose acetate, especially if mounted on wire, are satisfactory substitutes in some situations.

Muslin and cheesecloth afford but little protection, and are as a rule unsatisfactory.

SOIL PREPARATION

Soil for seed and seedlings should be finely pulverized and mixed with sufficient manure and sand to make it loose and well aerated.

Before soil is used it should be sterilized by heating to 190 degrees Fahrenheit or above for two hours with steam, hot water, hot air, or electric heat, or by thoroughly mixing it with a 6 per cent formaldehyde dust at the rate of $\frac{1}{2}$ pound for each bushel of soil. After the formaldehyde treatment, seed may be sown and the soil thoroughly watered. A 4-12-4 fertilizer, thoroughly mixed with the soil at the rate of 1 pound to a 6- by 6-foot bed, is usually adequate for seedling production.

SOWING SEED

Seed is sown in furrows in the soil, which are about $\frac{1}{4}$ to $\frac{1}{2}$ inch deep and usually $1\frac{1}{2}$ to 2 inches apart. If the seedlings are to be transplanted one or more times before they are set in the field, the seed may be sown at the rate of 20 to 30 per inch of row. If the seedlings are *not* to be transplanted prior to the time they are set in the field, the seed should be sown at the rate of four or five per inch and the seedlings subsequently thinned to one or two per inch.

Commercial gardeners may wish to grow more stocky plants and will, therefore, provide more room.

SEED TREATMENT

The warm season vegetable seed is usually coated with fresh red copper oxide prior to planting in order to control some of the diseases that may be carried on the seed. Do not use the oxide on cabbage and related seed (see Bulletin 76 of the Agricultural Extension Service, "Control of Garden Insects and Diseases").

TIME OF PLANTING

Seed for the early cool season crops of cabbage, cauliflower, leaf and head lettuce, beets, and celery should be sown in the hotbeds in central Ohio about March 1. This will usually give plants ready to set in the field from April 1 to April 10.

Seed for the early warm season crops of tomatoes, eggplant, peppers, melons, and cucumbers should be sown about April 1 to 10 in central Ohio. Plants should be ready for setting in the field May 10 to 20. Sweet potato roots should be bedded about April 20.

Seed should be sown 5 to 10 days earlier in southern Ohio and 5 to 10 days later in northern Ohio.

In some instances seedlings started in hotbeds are transplanted 10 to 15 days later to other hotbeds or coldframes. Coldframes are unheated frames.

CARE OF PLANTS IN HOTBEDS AND COLDFRAMES

The temperature should be held at 50 degrees Fahrenheit during the night and at 60° during the day for cool season vegetables, and at 60° at night and 70° during the day for warm season vegetables.

The foliage of the plants should be KEPT DRY; moisture should never be allowed to condense on the plants, as foliage diseases are sure to result. For this reason it is best to add adequate heat, so that fresh air can be admitted by ventilation (provided by raising the sash by blocks placed under the middle of sash on the leeward side). For the same reason the plants should be watered only during the morning when the sun is shining, so the foliage will dry as quickly as possible. Sufficient water should be applied for rapid but stocky growth.

HARDENING THE PLANTS

The cool season vegetables should be subjected to lower temperatures and less water for 7 to 10 days immediately prior to the time they are set in the field, in order to accustom them to rigorous weather conditions. It does not pay to harden the warm season vegetables.

TRANSPLANTING

The essential feature to all transplanting operations is to transfer the plant from place to place without injuring the roots or tops, and to set the plants in moist soil so that the moist soil is well firmed around the live, uninjured roots. Obviously it is easier to replant small seedlings without injury than it is to replant large seedlings.

Some gardeners employ pots in order to replant (transplant) seedlings without disturbing the roots.