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Center for Smart Agriculture

Protected floriculture

Module 1: Importance and types of protected structure

Session 4: Types of protected structure
(Cold frames & Hot Beds)



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- Hotbeds and cold frames are used for the growing of plants out of the normal season.
- They are especially useful in early spring, but such structures can also extend the growing season in autumn.
- The hotbed and the cold frame are identical in structures.



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- The only difference between them is the source of heat.
- The **sun supplies** all the **heat** in a **cold frame** whereas, sunlight is supplemented by **another heat source** in a hotbed.
- Plant growth is **slower in a cold frame** than in a hot bed.



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- A cold frame is used to provide shelter for tender perennials, to "harden off" seedling plants or to start cool season crops such as cabbage, cauliflower, lettuce, and spinach earlier than they can be started in open soil. It is a means for extending the growing season.
- In many ways it is a miniature greenhouse, providing the same benefits with limited space at minimal expense.



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Location:

The ideal location for a cold frame is a southern exposure with a slight slope to ensure good drainage and maximum solar absorption.

Constructing the bed :

- Basically, the hotbed or cold frame is a rectangular box with the back higher than the front, covered with a transparent roof.



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Sash and coverings:

- The sash available will determine the dimensions for the bed.
- Glass sash is the conventional frame covering and generally the best.



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Framework: The framework of the bed can be constructed from wood, concrete, or concrete block. When wood is used, the boards may be 1 or preferably 2 inches thick. Redwood, cedar treated with a preservative is best.

- The front of the bed, to the south, should be 10 to 12 inches high inside, with 2 inches extending below ground level.



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Preparing the bed area:

- The area for the bed must be levelled. Although temporary frames may be set on the soil surface, excavation is required for more permanent structures.
- Most home hotbeds are heated with electric coils, but where fresh manure is available, it may be used. A deeper excavation is generally required for establishing a manure-heated bed.



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Hotbed Heating Systems

1.Pit Hotbed:

- When manure is used to supply heat, the soil inside the bed should be excavated to a depth of 16 to 18 inches.
- A 4-inch layer of coarse cinders or gravel forms the bottom portion for drainage and improving the aeration of the bed.



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- Fill the bed with manure.
- Then tap firmly and evenly, especially in the corners.
- The taped manure should extend an inch or so above the ground level on the inside of the frame.
- Moisten the manure evenly with lukewarm water to ensure uniform heating.



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2. Electric Hotbed

- Electric heating requires an insulated heating cable enclosed in a flexible lead sheath covering.
- About 2 feet of cable for each square foot of bed area is needed.
- Excavate the soil 2 or 3 inches below the frame level.



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- Then put down 4 inches of cinders or sand as a base for the cable.
- When you lay the cable, start and end with the outside row 3 inches away from the frame, and make a series of long loops 6 inches apart across the bed.
- Laying hardware cloth over the cable prior to covering it with soil will help prevent the cable from being pulled out of the soil.



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3. Steam- or Hot Water-heated Hotbed:-

- The use of steam or hot water circulating systems is practical when the beds are supplementary to a greenhouse operation.
- The heating pipes may be placed under the soil or around the inside edge near the top of the frame. The heat is turned on or off as needed.



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