



**Studying the
Effects
of
Cold
Temperatures
on Plants?**

*Demanding research
requires innovative solutions!*

The technical challenge.

Plant growth chambers and rooms can be an effective tool for use in cold temperature research on plants. In order to reduce temperatures within in the plant growth area heat needs to be removed from the chamber. This is accomplished by circulating the warm air from inside the plant growth chamber, through a cold evaporator coil, thus removing the heat and reaching the desired temperature setpoint.

Typically, plant growth chambers have a minimum temperature specification of +10°C lights on. When a chamber is programmed to cool below this temperature, the evaporator coil will reach a temperature below 0°C, causing moisture to condense and begin to freeze on the evaporator coil. The build-up of frost and ice will eventually block air circulation within the chamber, and reduce the chambers ability to operate at lower temperatures. To prevent frost or ice build up on the the evaporator coil periodic defrost cycles must be completed to melt any accumulated ice.

BioChambers offers three defrost options.



1 BioChambers' STANDARD DEFROST Option

BioChambers' Standard Defrost (SD) system works well for general low temperature plant research experiments where temperatures below +10°C are required for a short period of time. The standard defrost (AD) option with a defrost cycle includes the following:

- Defrost cycles repeated every 2 to 4 hours
- Defrost cycle time of 5 to 20 minutes
- Defrost temperature increase of 5° to 10°C in the growth area during the defrost cycle
- Lights within the growth area are turned off during each defrost cycle

This system is available as an option on most chambers and rooms offered by BioChambers.

2 BioChambers' AIR DEFROST Option

With BioChambers' Air Defrost (AD) system, defrost is accomplished by continuously defrosting the ice off of one evaporator coil, while separate coils maintain growth area temperature. This allows the chamber to achieve a minimum temperature of +4°C (all lights on) with no temperature increase during defrost.

The air defrost (AD) option is an excellent choice for plant vernalization experiments. This system is available as an option on most chambers and rooms offered by BioChambers.

3 BioChambers' CONTINUOUS SEQUENTIAL DEFROST Option

BioChambers' Continuous Sequential Defrost (CSD) system continuously defrosts ice off of the evaporator coil, and is able to achieve temperatures as low as -10°C (all lights on) with no temperature increase during defrost.

The CSD option is an excellent choice for plant cold hardiness experiments, and is offered on low temperature chamber Models LTCB -19, LTC-37 and also on the LTRB Room Series.

Comparison	Standard Defrost (SD)	Air Defrost (AD)	Continuous Sequential Defrost (CSD)
Simple low cost design	✓		
Below 0°C capability	✓		✓
No temperature increase during defrost		✓	✓
Lights on for defrost		✓	✓
Dimmable LED lighting at all temperatures			✓
Lights full-on at low temperatures			✓
Models Available	Most models of Chambers and Rooms	Most models of Chambers and Rooms	LTCB-19, LTC-37, LTRB Room Series

For more information on our low temperature options please contact BioChambers by phone at (204)589-8900 or on the web at www.biochambers.com.

