



Critical Elements of a Mushroom Fruiting Room





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What Is a Fruiting Room?

A fruiting room is designed as a space where the proper environment is created to produce high-quality mushrooms.

The needs of a fruiting room can be summarized as follows:

- High humidity (80%–90%+)
- Low light
- Consistent temperatures of 55°F–70°F, depending on species
- Air exchange to prevent CO₂ buildup as mushrooms grow

Given these parameters, the recommended materials for constructing a room must tolerate persistent humidity. Avoid wood and other absorbent materials. Steel or aluminum studs are ideal. Wall coverings should be water-resistant and easy to clean. One common material is corrugated plastic paneling ([Coroplast](#), for example) with edges sealed with [ZIP](#) or [3M](#) flashing tape.

The room will be cleaned often, so good drainage is essential. You could achieve this by utilizing a wet/dry vac, but better is to have a floor drain so it's easy to wash out the room. Ideally, the drain has a P-trap to prevent outside air from coming in, which can affect the room temperature and introduce contamination.

FRUITING ROOMS ARE DIRTY. It's important that your heating/cooling and humidification equipment does not recirculate the dirty air, so one design idea is to create a plenum for this equipment. A plenum is a space from which the equipment can draw in clean air. Efficient fruiting rooms ideally have this buffer space between the fruiting room and the outside environment. Sometimes called a "lung," the plenum is a space

in which you can precondition air with temperature controls before allowing it into the fruiting space. Keeping your cooling and heating units, as well as a humidifier vessel, outside the fruiting room also greatly helps prevent buildup of contaminants and spores and extends the equipment's usable life. The plenum could be an auxiliary room, a hallway, or a similar space.

It is ideal to maintain NEGATIVE PRESSURE in a fruiting room. This means that as CO₂ builds up (fresh mushrooms produce it), an exhaust fan turns out and pulls dirty, high-CO₂ air from the room to outside the building. The air leaving can be replaced by fresh incoming air, ideally from the plenum mentioned above, where it is preconditioned to the right temperature and humidity. The replacement air may be assisted with an intake fan or just moved by the simple displacement of air as it is exhausted.

Critical Function #1: Temperature

Depending on the species and strain, mushrooms range in preference from 55°F to 75°F. Most commercial species prefer around 65°F.

How easily you can maintain this temperature depends on the siting and sun exposure of your building, the seasonal variation in ambient temperature, the insulation value of the building, and the cooling and heating elements available. Modeling can estimate this, but a bit of experimentation or trial and error is often needed.

Often heating is not the challenge—cooling is. Space heaters in a well-insulated space often maintain ideal temperatures, but cooling is a whole other story, especially in hotter climates.

RECOMMENDED EQUIPMENT

1. [Heat pumps](#) are becoming more popular and cost-effective, able to both heat and cool a space precisely and efficiently. They are best in permanent situations.
2. Portable heaters and AC units are commonly used and less expensive, although they often wear out and need replacement sooner. Flat ceramic panel heaters, such as [1](#), [2](#), and [3](#), are easy to clean and avoid contamination.



3. Controllers: It's nice to be able to turn heating and cooling devices on and off as needed to maintain target temperatures. [CoolBot](#) is an excellent device that helps a regular window AC unit or some heat pump models maintain relatively low temperatures (65°F–35°F), which is ideal for some mushroom species. [Inkbird](#) offers nice devices with Wi-Fi versions that can be controlled and monitored remotely: [Temperature Controller ITC-308](#) (or [Amazon](#)).

Critical Function #2: Fresh Air Exchange

As mushrooms fruit, they generate CO₂, and CO₂ buildup in the fruiting room tends to cause quality and contamination problems. The best strategy to overcome this is to set up one fan to exhaust air from the space to the outside and another to bring clean, fresh air from the plenum into the fruiting room.

You can use inline duct fans and calculate the cubic feet of space in the fruiting room to determine which size fans you need, as fans are rated by CFM, or cubic feet/minute. Ideally, all air in the room should exchange within 2–3 minutes. You can set a timer to run the fans on a repeat cycle, but a CO₂ meter set for 700–800 ppm is more efficient; the fans will kick on once the CO₂ ppm limit is reached.

RECOMMENDED EQUIPMENT

Sensors:

[Inkbird CO2 Controller ICC-500T with S01 Sensor](#) (or [Amazon](#))

[CO2meter.com Controller for Mushroom Farms or Growers](#) (or [ISC](#))

Fans:

[Hurricane inline fans](#) (or [Hydrobuilder](#))

[Cloudline fans](#) ([Amazon](#))

Critical Function #3: Humidity

After balancing temperature regulation and air exchange, you must establish and maintain humidity in the 80%–90% range generally. Of the many available humidifiers, ultrasonic devices provide a finer mist and are generally better. It is critical that the water be free of contaminants. Ideally, the humidifier is kept outside the fruiting room in the plenum and all equipment is cleaned completely at least every two weeks.

Controllers:

[Inkbird Humidity Controller IHC-200](#) (or [Amazon](#)) ([Wi-Fi version](#) to monitor from a phone—or [Amazon](#))

Humidifiers:

[House of Hydro 12-disc kit](#) (or [Grow Ace](#))

Waterproof Fans:

[House of Hydro waterproof fan kit](#) (or [Grow Ace](#))

UV Light:

[UV reservoir sterilizer](#) (or [Grow Ace](#))

Example:

[Good DIY humidifier box](#)

Critical Function #4: Light

This is the easiest element to control; all you need are simple LED rope lights that can withstand the humidity and offer low-light conditions (blue spectrum often seems best).

Purchase rope lights with flat backs, such as [1](#) and [2](#), for easy attachment to the ceiling of your grow space with plastic electrical-wire staples, such as [1](#) and [2](#).

Run the light cycle with a timer available at places like [Home Depot](#) or [Lowe's](#), and set for 16 hours on and eight hours off. On at 6 a.m. and off at 10 p.m. is common, but you can adjust the setting to suit you.





Summary

Temperature (maintain 55°F–70°F)

- Heater
- Cooler
- Temperature monitor-controller

Options: Space heaters, window and portable ACs, ducted systems, air-source heat pumps

Air Exchange

- Intake fan
- Exhaust fan
- CO₂ monitor-controller, splitter so both fans can plug into it

Humidity

- Ultrasonic humidifier
- Humidity monitor-controller
- Bin-and-fan setup with UV light

Light

- LED rope lights
- Outlet timer

If you use any of these resources, please let us know! We would love feedback on what worked well for you and any challenges you encountered. Reach us via email at info@thetransformationproject.org.
