

Airflow and Temperature

Just as having a powerful light and quality water is important, airflow is no exception. It is very important to maintain good air movement and circulation within the environment to control temperature and humidity, as well as provide an adequate supply of carbon dioxide (CO₂). You do not need to create a powerful vortex or wind tunnel to achieve great results. Depending on the size and magnitude of the operation, anything from a simple fan in the room up to a powerful HVAC system is appropriate. Having fresh air come into the environment as used, old air is exhausted out is ideal. It is important to calculate the cubic footage within the environment to be able to get a system rated high enough to accommodate the given space. It is a simple calculation of Length X Width X Height = Cubic Footage. For example if I have a 10 x 10 room that gives me 100 ft.², and if the ceiling is 8 feet tall that gives me 800 ft.³. It is as simple as finding an exhaust fan rated with a high enough cubic feet per minute (CFM) to accommodate my environment. We recommend Can Fan brand, but there are many different brands to accommodate any situation and provide terrific results. Most plants prefer an environment between 70 and 80° with the humidity of 40 to 55%, depending on stage of growth and crops being grown. Other equipment used to keep the environment stable will be heating and cooling sources as well. Most of these variables can be controlled automatically as well as manually depending on the individual needs of each grower.

CO₂ enrichment is desired by many growers because it allows the plants to keep photosynthesis up at a higher rate, especially if temperatures rise too much. It also allows gas exchange between the plants and the environment. Regularly exhausting the room and replenishing it with fresh air allows for transpiration to take place effectively. Transpiration is when water vapor escapes from pores under the leaves known as stomata. Evaporation will take place within the environment whether it be from a reservoir full of water in hydroponics applications or soil having water evaporate as well. A plant breathes by taking CO₂ in through the opened stomata and releasing water and oxygen into the environment. The larger the plant, the more stomata it has to make this exchange. Carbon dioxide can be provided in a few ways. Most hobbyists

and professional growers use CO₂ tanks with regulators and timers to sync dispersal with exhaust cycles. CO₂ is heavier than air, so it must be dispersed from above the canopy. To avoid having the fans exhaust the CO₂ before the plants have a chance to use it, the fans will shut off for a brief duration to allow the plants to utilize the abundant CO₂. Once this has occurred, the CO₂ regulator will stop dispersing and the exhaust will come back on. This will continue to happen cyclically, depending on the grower and the crop being grown.

Humidity directly relates to temperature. Many flowering plants prefer a relative humidity of 40%- 60%. The lower range discourages pests and other problems. When humidity is high, water evaporates slower. This causes the stomata to close causing transpiration to slow down, along with plant growth. When the air is drier water evaporation is quick. This stimulates the stomata to open, and increasing transpiration and fluid flow as well as growth.