



# Grow Room Air Movement

*We feel your pain!*

The problem – the amount of good information on Cannabis Grow Room Air Movement coming from a reliable source is limited! Some of it is well meaning but uninformed and some of it is just shilling for equipment distributors. Here is a summary of what we have learned to date based on good engineering principles and common sense.

Air movement in a grow room is meant to address several issues:

- An important reason to provide air movement is to reduce the boundary layer of air at the plant leaves. This increases the respiration of the plant allowing additional CO<sub>2</sub> to reach the leaves and reduces the humidity in contact with the leaves which increases uptake of water and nutrients to the plant stimulating growth.
- Reducing humidity particularly in the under-canopy space since this stimulates the drying of certain types of grow mediums, but more importantly reduces the possibility of mold and other pests which thrive in a humid area.
- *Achieving uniform temperature and humidity within the grow room which is essential for overall control and elimination of hot, cold, or humid pockets which change the conditions for certain plants.* [You want the whole grow room to achieve the same results, don't you?]

It is the last item that this document addresses – getting sufficient circulation in a grow room to produce a consistent environment.

[Haven't built out your Grow Room?](#)

Excellent! Now is the time to address this issue before you create a new grow room with this problem.

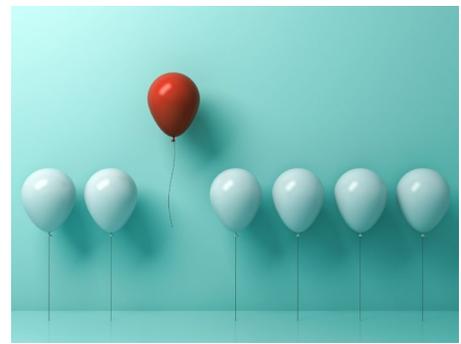
Our opinion is the selection of equipment for HVAC system for grow rooms is reasonably good. Most HVAC engineers now understand that they need to take into consideration the high heat and humidity loads that are found in a grow room environment. So the equipment itself isn't usually an issue (see below for a potential exception) *but the ductwork can be a huge problem in getting a consistent environment.*

We suspect that for a number of reasons the design of the ductwork is often left to the ductwork contractor. These folks work from experience and rules of thumb to design the ductwork. *But these rules of thumb and experience are based on providing conditioned air to open plan offices or large commercial spaces like stores or malls. Grow rooms are quite different because of the huge heat load (even with the more efficient lighting now available) in a relatively small space.*

The common way in which large spaces are ducted is to place both the supply (cold air) and the returns (going back to the HVAC units) at ceiling level. This works fine for an office because there isn't really any other air movement nor large heat loads. There, the cooler air will descend down to floor level due to the higher density and the hot air in turn will rise back up to the returns.

In a grow room however what we believe\* happens is that because of the large heat load a bubble of hot air forms that keeps the cooler / cold air from descending or descending evenly. Aside from the fact that this helps to create uneven conditions at the plant level, we also think that it makes a lot of the cooler air short circuit right to the return duct having never actually providing any cooling!

What is the solution? Well it all depends on the design of the HVAC system and your grow room (and this really isn't what aGROair does!). But what we highly suggest is that you ask your HVAC contractor about this problem and how to address it. And yes, it might mean that you won't need as many or perhaps smaller



## What air wants to do!

Just in case you don't know – hot air is less dense than cold air and hence will rise towards / to the ceiling. In still air, one would expect to see about one half degree for each foot of elevation.

*What most people don't realize is that humid air is less dense than dry air!* [Yes we know that doesn't seem right.]

So the combination of hot and humid air is always going to rise towards the ceiling at least in theory.

fans in your grow room but that is alright since there are lots and lots of already completed facilities that have this issue!

One other comment about grow room design based on our observations – using “split” HVAC systems. “Split” systems are rather clever units that are becoming more and more common. Whether or not they are truly designed for the rigors of a grow room is an issue that we are not really qualified to have an opinion, but what we do know based on our observations is that because they are wall mounted there is a significant difficulty in getting the cool air to distribute throughout a grow room. [That is alright since aGROair’s fans can help solve this!] We are also very surprised when we go in a grow room that is cooled by a single “split”. Not only does this make distribution more difficult but there is no redundancy. How long will your plants last without cooling even if you turn off the lights?

### Existing Grow Rooms

Your existing grow room has problems – hot spots, humid pockets, just inconsistent pockets that just won't seem to go away? We see this a lot and the solution often depends on the details. But we can very clearly tell you *what isn't going to work*:

- Installing multiple oscillating fans. AGROair provides oscillating fans and they are a good option for canopy ventilation. *What they aren't going to do is solve the inconsistencies in your grow room. Why?* Because just by their nature they are not going to provide a coherent airflow pattern (even if they start out in sync they are not going to stay that way). We have found that inconsistencies are stubborn enough that without a coherent solution they aren't going to be resolved.
- Horizontal Airflow Fans (HAF) – We have seen the results of the recommendation of install

**Contact aGROair sales representative and talk with them about your space and what is recommended.**

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