

## How do I add ventilation to my grow area?

There are a couple of considerations to observe when planning your ventilation, they're pretty simple concepts; but they are often overlooked. • First, remember that warmer air will naturally rise to the top of any container, and that cooler air will naturally settle towards the bottom. • Also remember that when ventilating any space, the volume (VOLUME, in cubic feet or cubic meters... [L x W x H]) of air that goes IN, also has to come OUT. • You can't expect to ventilate a grow space by simply forcing air in, and not providing an exhaust vent. Since the object is to remove as much warm air as possible, and replace it with cooler air, it will be most efficient to place the exhaust as close to the top of the space as possible, and place the intake as close to the bottom as possible. Should I place the fan in the exhaust, intake or both? The fan should be placed in the exhaust, and the intake should be a simple hole (or light trap, if light getting out is a concern). This type of system is known as an Active Exhaust, Passive Intake System. Mounting the fan in the exhaust, sucking air out of the room accomplishes a couple of things... • Since the exhaust is at the top of the area, the fan will suck the hottest air out of the area first. • The fan is actually lowering the air pressure inside the area. Any incidental pinholes or leaky seams will simply draw air in. If the fan were blowing IN, those pinholes and leaks would allow potentially smelly air OUT. How big should the passive intake be? It should be slightly larger than the exhaust. Remember, the volume of air being blown out, will be replaced through the intake. Using a bigger intake hole allows the incoming air to be at a lower velocity (speed), which minimizes mixing up of the air in the area. It will also allow the fan to operate more efficiently. How big should the fan be? Fans are rated in either cubic feet (CFM) or cubic meters per minute in North America. In Europe, metric fans are rated in m<sup>3</sup>/hr - cubic metres per hour (m<sup>3</sup>/hr). That means a 70CFM fan will move 70 cubic feet of air in one minute. Your fan should be big enough to move the volume of your area 2 to 3 times every minute. A 70 CFM fan would be adequate for a 35 cubic foot area, and would be optimal for roughly a 23 cubic foot area. • To figure your area's cubic volume, multiply (in feet) the length by the width by the height. What if I have more than one fan? Should I use one to blow air in and one to suck air out? Not if the object is to provide as much ventilation and cooling as possible. • If you have two 3-inch diameter fans, and you mount one in the intake, and one in the exhaust, you have a total intake area of one 3-inch hole and a total exhaust area of one 3-inch hole. • If you use both fans as exhausts, you have TWO 3-inch exhausts and two 3-inch intakes (actually, two 3.3 inch intakes. They should be bigger than the exhausts, remember?). • Twice as many holes, twice as much airflow.

### Enhanced Blower Mods

#### Timer Options

If you find that the "Lights off" temps are lower than you'd prefer, you can simply run the fan from the same timer as the light by using a multi outlet power strip connected to the timer. Plug the lights and the fan into the power strip, and the fan will turn on/off with the lights. If you're using more than one fan, you could connect some or all of them, remembering that the more fans you have running, the lower the temps will be. \* SAFETY NOTE: The timer must be able to handle the additional electrical load, or an additional timer must be used. SAFTEY FIRST.

#### Sound Suppression

Making the ventilation system quieter can be an important consideration, and it's important to remember that the air moving through the intakes and exhausts make noise, as well as the fan itself. Some of the fan noise from vibration can be overcome by mounting the fan in a non-rigid manner. The fans can be mounted using rubber grommets to help dampen the vibration. Self-adhesive foam rubber window insulation can also be used. In some installations, it can be mounted by threading a bungee cord through each mounting hole, then attaching the other ends of the bungee cord to the exhaust hole. • Generally, air moving through ductwork or tubing can become noisy, particularly if the air has to move at a higher velocity. More, larger diameter intakes and vent tubes will generally be quieter than fewer, smaller diameter intakes and vents. The fans also don't have to work quite as hard. • Finally, although popular and easy to use, flexible "Accordion" type hose, commonly used to connect clothes dryers to external vents are not always the best choice, as they cause a great deal of drag, (making the fans work harder) and generally air flowing through them is noisier than smoother ductwork.

#### Filtering\Odor Control

Connecting a Carbon scrubber is a good method of controlling the odor that can be a dead giveaway to an otherwise stealthy installation. A carbon scrubber is simply an expansion chamber (box) into which the smelly air from a flower chamber is pumped. The chamber has a large exhaust vent, which is covered by an activated carbon air filter. The chamber must be big enough to provide a damping effect of the incoming air. If too small a scrubber is used, the fan will not be capable of pushing air through the filter. Here, you actually want the exhaust vent to be considerably bigger than the intake. • There are also several DIY Odor killers available, which work to varying degrees to provide an "Odor Cover-up." • Remember, the term "Low Odor Strain" is relative. • Even the low odor strains generally still stink pretty badly near the end of flowering.