Ozone: An Indoor Garden Super Tool

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Ozone generators are becoming more affordable and are a common feature in larger commercial growrooms. Domestic and industrial use of ozone is not new, but translating the many benefits into a grow operation deserves a little attention. An inexpensive ozone generator is capable of saving crops from molds, battling predators, oxygenating root zones (the area of oxygen and soil surrounding the roots of a plant), sterilizing equipment, disinfecting entire growrooms and more.

We have all heard about ozone, and how the lack of it in the atmosphere caused by pollutants is a problem, so one might ask, “Isn’t using an ozone generator just going to compound climate change?” The simple answer is no. The ozone we generate in growrooms is the same stuff that protects us in the ozone layer of Earth’s atmosphere, but it will not harm the planet.

Ozone (O_3) is a triatomic molecule consisting of three oxygen atoms (instead of two in regular oxygen). Oxygen is one of the most powerful oxidizing agents in the world, and a potent natural disinfectant 3,000 times more effective than chlorine bleach in broad-spectrum antimicrobial activity. Ozone is not just another cleaner, ozone is a true sterilizer. It can destroy impressive amounts of spores, bacteria, viruses, mold, fungus,

mildew, smoke particles and other contaminants while at the same time oxidizing any dead organic materials in its path. Because ozone has a spare, unstable oxygen molecule, as soon as it touches a pathogen, the spare atom breaks off and attacks the cell walls of the pathogen, rupturing them and killing it instantly, without hesitation or mercy.

Ozone Safety

Ozone is used in low atmospheric doses in hospital wards, offices, veterinarian rooms, commercial kitchens and factories to keep the air sterile, sterilize bedding, prevent the spread of airborne pathogens and keep the place smelling clean. People occasionally use it at home to sterilize dishes, treat various ailments and make their homes a little fresher. Because ozone is so powerful, it can be harmful to humans and pets if precautions are not taken. Ozone may be harmful to the respiratory system if breathed in high concentrations, but the fact that it breaks down quickly allows us to work with it in relative safety. The safety aspects in this article are overly cautious, but it is worth taking the extra care.

Fortunately, people can start to smell ozone before it becomes hazardous. The familiar smell of ozone, is like that fresh smell after a heavy storm, which is the ozone created by electrical energy in the clouds and brought down by rain.

Choosing an Ozone Generator

Choosing the correct ozone generator is important. Too small an output will be ineffective, too large could be dangerous. For an average-sized grow space, a generator with an output of around 200 to 400 milligrams (mg) per hour will be fine. Huge commercial operations will need upwards of 1 gram of output per hour, and micro-grows can get by with under 100 mg per hour. These are only guidelines.

Using an Ozone Generator Safely

as a rule (in a growroom sized space), you should never be able to smell ozone from your generator while it is switched on. If you do smell ozone strongly, you are generating more ozone than you need. Switch off the machine and leave the room for at least 45 minutes while it disperses back into plain oxygen.

Using a timer will help you determine the right amount of time to run your ozone generator to avoid oversaturating the growroom airspace. Keep all pets away from the ozone generator while it is running, and for at least 45 minutes after it has been switched off. Get everything else completely ready before you switch on your generator. It should be the last thing you switch on before quickly leaving the growroom. Always connect it to a timer to switch it off after it has finished. Some have a built-in timer, but experience says they are not always reliable. If you need to re-enter the room while the generator is running, it is best to wear a mask or hold your breath as a precaution.

Ozone is safe for humans if it is not breathed in at heavy concentrations. Consider buying an ORP (oxidation-reduction potential) sensor to monitor safe ozone levels in your growroom. Ozone Test Strips are also a great way to monitor ozone levels. Close the door of your growroom to keep the ozone contained and let others know when the ozonator is running so they too may stay clear of the room.

Sterilizing Your Room and Equipment

Sterilizing your room and equipment is one of the biggest hassles of being a grower. Ozone acts as a magic bullet that cuts out such soggy labor. You will still have to manually clean up debris with hot water first, but that's the hard part done. Let equipment dry, and then stack it up so air can circulate freely around it. Include things like scalpels, pruners, pH meters, screens and fans because ozone sterilizes everything!

Position your generator in the center of the room and switch on some circulating fans so the air can circulate around the entire room. Since ozone is heavier than oxygen, you will want to mount the ozone on a shelf, high enough that when the ozone falls it will hit the air being circulated around by the fans. Set up a timer to switch off after 30 to 45 minutes. Plug your generator into it and turn it on. The generator will switch off after the set time and the room will be safe to re-enter an hour after that. If your growroom is in the main part of the house, then it is probably a good idea to open the windows to allow any leaking ozone to escape. That's it! Your room will smell incredibly clean and is now completely sterile, ready for your next grow.

Inline Odor Control

The most common use of ozone by growers is inside the ventilation ducting. This gives an extra insurance against unwanted odors escaping. This method is completely safe because the ozone is immediately extracted through the ventilation system into the outside, leaving no possibility of ozone buildup inside the growroom. For this set-up, you need a medium output inline generator to place inside your ducting. Here the ozone molecules mix with the smelly plant terpenes inside the pipe. In an ideal world, you would have this inline ozone system paired with a portable ozone generator.

No More Bud Rot

An ozone generator can save crops from botrytis (a fungal disease that commonly affects plants exposed to cool, damp climates also known as known as gray mold or fruit rot) and other pathogens, even if it's already started to weave its gray web around plants. It does this quickly without adding any toxic chemicals at all. Here's how to go about it:

- At the first sign of mold, physically remove any infected material from the room.
- Switch off your extractor fan but leave your circulation fans running. (You will need to set a timer to switch your extractor back on in about 15 minutes).

- When using a 400 mg per hour generator, try running it for 30 to 45 seconds per square meter of enclosed grow space and then switching it off.
- Leave the extractor fan off for 15 minutes afterwards, but make sure the circulation fans are moving lots of air around inside.
- After the extractor fan has been on for 15 minutes, open your tent and look at the mold. Instead of looking a vibrant, fluffy gray, it should now look brown, crusty and dead.
- If mold is more progressive, you may need to run the ozone for longer. For serious infestations, run for up to an hour without the extractor on.
- Dispose of any previously infected matter. Although the mold is no longer active, it should not be ingested.

Inspect every plant thoroughly, and if there is any mildew alive, repeat the process. Be aware that building up too high a concentration of ozone in a room can cause plant damage to the stomata (microscopic pores found on the epidermis-skin of plants), resulting in burnt leaves, especially at the tips and wider shade leaves closest to the generator. There have also been reports of it damaging the delicate trichomes (tiny hair-like components that are found on the epidermis-skin of several types of plant stems and leaves) with major overuse. At the tip of the hairs of these specialized formations are glandular cells that produce, store, and secrete substances, mainly valuable essential oils. Check your plants for new mold thoroughly every day for a week, and if you spot anything new, repeat the process.

Battle Spider Mites

Spider Mites, a garden pest of the Acari or mite family of insects, live and feed on the bottom side of a leaf on a plant and spin a powdery white web, sometimes confused with powdery mildew. Spider mites can spread fast and are tough to beat. A higher level of ozone will break down the respiratory systems of spider mites and kill them. Be warned that the levels you need to run ozone at to kill spider mites may cause plant damage, but spider mites will cause worse damage.

Conclusion

Ozone is a wonderful tool for the hydroponic gardener. If treated with respect, it can troubleshoot many problems and maximize efficiency in a growroom.