



**Subject: BioRadiance Grow Science Position on Air Purifiers**  
**From: BioRadiance Science Team led by our Ph.D. in Plant Physiology**  
**Date: September 2018**

## **BRe<sup>3</sup> WAND VERSUS AIR PURIFIERS**

### **SCIENCE FACT BASED PREMISE**

The BRe<sup>3</sup> Wand is more effective than Air Purification solutions. Why? Pathogens must be on or in the plant to physically attack and damage the plant. The Wand rapidly and continuously destroys pathogens on and in the plant, where air purification destroys airborne pathogens.

### **INTRODUCTION**

These two solutions and their devices take different approaches to pathogen destruction. The BioRadiance<sup>3</sup> Wand kills pathogens both on and in the plant itself. While they can work in tandem, the BRe<sup>3</sup> Wand should be the first choice because it adds so much more to the success of the plant's growth, overall health and ultimate quality and yield. Air purifiers are effective in killing bacteria and fungi in the air. Air purifiers add no known direct growth or yield stimulation. These units must have proper air circulation to be effective in an indoor grow and have been ineffective in a greenhouse grow.

If as cultivators and growers, you believe in redundancy is the best pathogen control policy, these two distinctly different approaches can work together to control plant diseases caused by bacteria and fungi.

### **AIR PURIFIER (AP) SYSTEMS**

There are two different types of air purifiers – Oxidizers and Radiation.

Oxidizers use ozone or hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) as their active ingredient to aggressively combine with the pathogens and destroy them. Both substances require strict control because they are dangerous for human beings and plants. The short half-life of H<sub>2</sub>O<sub>2</sub> minimizes residue issues, though some of the chemical always remains.

Radiation units use UV-C light as their killing source. This radiation source must be strictly controlled because it is very dangerous. Many radiation units use titanium dioxide (TiO<sub>2</sub>) as a catalyst to support their process. Nanoparticles of TiO<sub>2</sub> are known to be very toxic so they must also be strictly controlled. It is widely recognized that air purifiers are regulated by the government and are considered safe. There is

concern that users may employ these units longer than their life expectancy which could be less effective and hazardous.

All air purification systems require enough air circulation to be effective. Depending on the AP system selected, each unit only handles a set amount of cubic air displacement effectively. In large buildings or in buildings that have gaps to outside air, there will be performance issues. Air purification systems normally cannot be effective in greenhouse environments because of the porosity of the structure. And in high ceiling grow environments, proper air exchange normally proves to be problematic and areas are not well covered allowing pathogens a place to reside.

From an ongoing cost standpoint, in most cases multiple units are required to properly exchange the actual air volume present in a specific grow space. Filter replacement is an additional ongoing expense and as the unit ages, its performance effectiveness decreases leading to new capital expenses.

### **BR3<sup>3</sup> WAND**

The BioRadiance<sup>3</sup> Wand uses the non-visible "Missing Wavelengths™ of Safe Light" which are normally provided by the sun to an outdoor grow but not supplied by today's grow lights. The missing wavelengths that the Wand provides are beneficial to plants in a multitude of ways:

1. They eliminate the bacteria and fungus on and in the plant itself.
2. They stimulate the photosynthesis/cellular respiration process that add more energy to the plant so that the plant can convert it to adenosine triphosphate or ATP – the plant's own usable energy.
3. This extra energy allows the plant to improve its cellular repair, stimulate added cellular respiration to further promote photosynthesis and to enhance phytohormones activity for better rooting and overall growth.
4. All this energy strengthens the plant, boosting its resistance to bacterial and fungal diseases.
5. The light therapy delivered by the Wand adds cellular energy in form of ATP, sugars and other organic substances necessary for metabolism and growth for the plant's benefit throughout all its life processes.

From an ongoing cost standpoint, the BRe<sup>3</sup> Wand requires minimal maintenance and has a 5-year warranty and the Wand will be highly effective then and beyond.

### **CONCLUSION**

The BRe<sup>3</sup> Wand is the correct FIRST choice for maximum pathogen protection because it adds so much more to the success of the plant's growth and overall health, quality and yield. Air purification and the BioRadiance<sup>3</sup> Wand can work in tandem. Cleaner air will make the Wand more effective. The Wand will reduce pathogens in the air that escape from the plant making the purifier more successful.

### **FOR MORE INFORMATION**



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