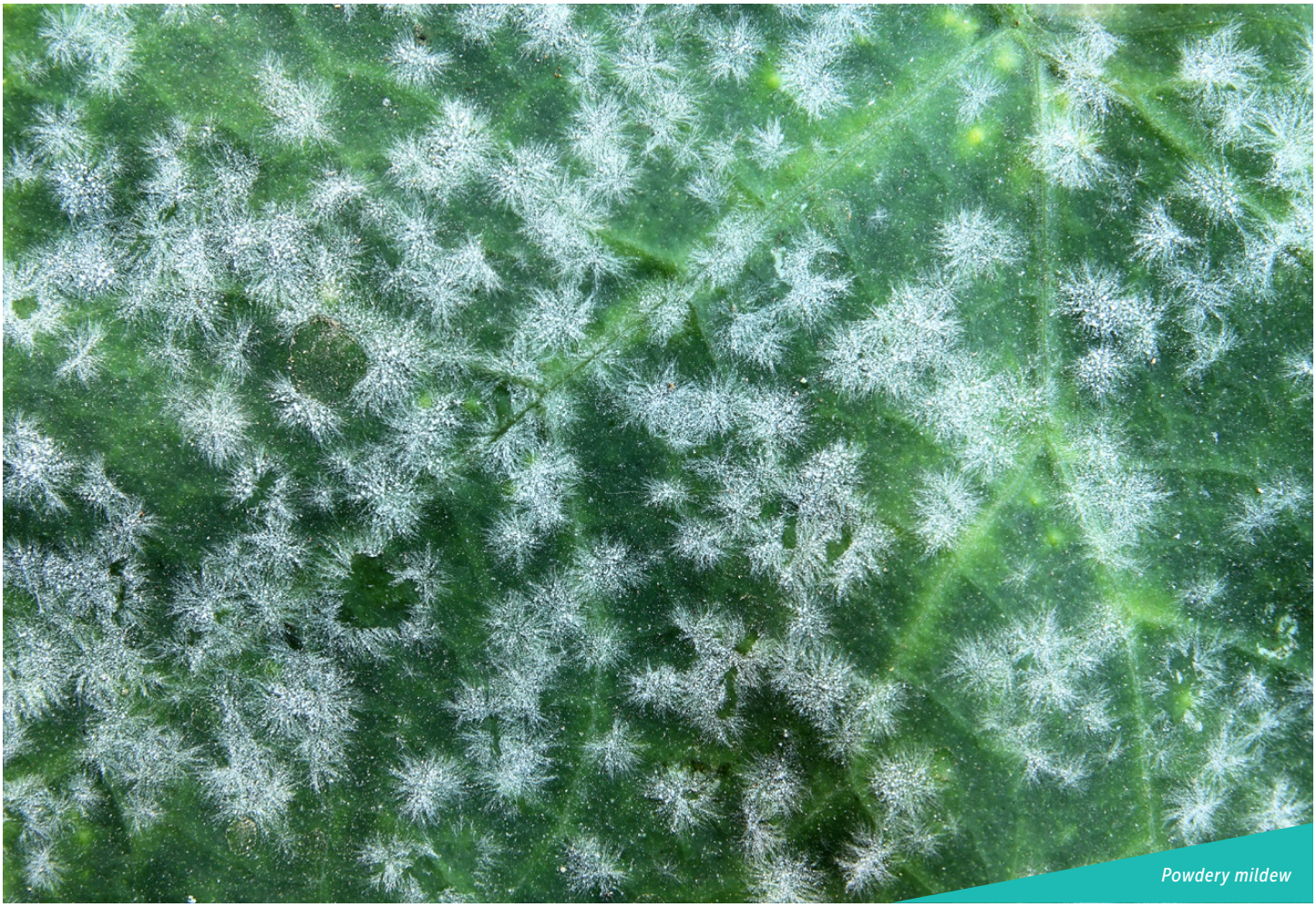
CLEAN AIR


Powdery mildew

Challenge

Plants are sensitive to bacteria, fungus and molds like bud rot. Introducing contamination to the Indoor Horticultural Environment (IHE) can have catastrophic results on the crop.

The ideal environment for mold and fungus spores to thrive overlaps with the ideal IHE climate. Bud rot, a common and particularly dangerous fungus for crops like cannabis, is most hazardous in areas of high humidity and moderate temperatures. Bud rot typically attacks denser parts of the plant where humidity is highest, causing significant damage to the infected plant. Germination of these spores can be disastrous in an indoor environment. The spores travel in the air, on clothing, and in water, and once they germinate, the mold can move quickly and spread passively throughout the entire crop.

Mold and mildew development in a grow area not only damages plants, but can also infect soils and growing media, and create an unpleasant or unhealthy environment for people. These contaminants are best controlled with precise optimization of the IHE, and application specific construction of the HVAC system to discourage the introduction and growth of contaminants in the IHE.

Solution

Protection against the introduction of hazardous biological contaminants

The SolutionAir GRW provides protection against the introduction of contaminants into the IHE by providing fully recirculated air. The lack of outdoor air prevents airborne spores from entering the grow area through the HVAC system.

When compared to a standard comfort cooling system operating at 400 cfm/ton, the GRW is capable of delivering 200% greater dehumidification capacity per ton under the same conditions, while providing independent temperature control with a tolerance of +/- 1 °F. By providing precise, independent control of both temperature and humidity, the GRW allows the indoor environment to be optimized to inhibit mold growth while maximizing potential for a healthy crop with high yield.

The GRW can be fitted with additional protection measures in order to further further reduce the risk of contamination.

Optional UVGI Lighting

The unit can be designed with ultraviolet germicidal irradiation lights (UVGI) to disinfect circulated air and cabinet surfaces of harmful micro-organisms in order to minimize crops health issues. After a certain amount of UV exposure, bacteria, fungi and molds that pass through or settle within the irradiated areas of the unit are neutralized.

Optional Variable Positive Pressurization

The GRW can be equipped with a specialized fan filter unit that increases the pressure inside the cabinet above atmospheric level. The positive pressure ensures that no outdoor air seeps into the unit through unseen gaps or spaces, which could otherwise introduce contaminants. Outdoor air pulled in through the fan filter unit is passed through an ULPA filter, ensuring even the smallest contaminants, such as black mold spores, are not introduced into the growing environment.

Cabinet construction to inhibit condensation and mold growth

The SolutionAir engineering team incorporated Computational Fluid Dynamics (CFD) analysis into the cabinet design process. The CFD analysis measured the surface temperature of the cabinet walls to identify areas at risk of condensation. The design goal of a low-leakage casing with no internal condensation in non-drain pan protected areas resulted in a unit that provides excellent protection against mold and contaminant growth inside the unit.

Thermally Broken and Insulated Cabinet

The GRW cabinet is constructed with our patented double thermally broken walls complete with 3.5 inch thick R14 stonewool insulation. The water repellent and fungus and mold resistant insulation meets NFPA 90A (0/0) flame and smoke rating standards, and has zero VOC content.

Marine Grade Aluminum Construction

The cabinet is constructed with marine grade aluminum that will outlast the typical painted steel construction in even the harshest environments. The smooth interior and air tight cabinet ensures a clean air stream and virtually eliminates the risk of introducing foreign contaminants.

Permanent Fastening System

Typical fastening systems loosen over time, reducing the cabinet integrity. The GRW incorporates permanent fastening techniques to maintain the integrity of the cabinet construction. Thermal breaks and the water repellent, mold resistant stonewool insulation remain equally effective over time.

Pressure Rated Cabinet

The cabinet is designed to minimize air leaks when under both positive and negative pressures. This reduces the likelihood of introducing contaminants into the sections under negative pressure, as well as losing conditioned air in sections under positive pressure.