



A *TITANIA* CASE STUDY

ERADICATING MOLD PROBLEMS

IN A LARGE CANNABIS CULTIVATION FACILITY

Challenge

As a new venture of profitable crops grown in a large multi-room cannabis canopy facility, our *Customer* began to build their brand and distribution to service Michigan customers. Continuous crop failures arose due to parasites & mold on their plants, causing a substantial loss of revenue. Their crew employed numerous popular remedies: caustic & hazardous chemical disinfectants and quaternary compounds employed to eradicate pathogens, but invasive spores managed to survive and cause persistent quarterly crop failures.

Mold spores are highly promiscuous & destructive. Passing stringent crop testing protocol in Michigan requires diligent eradication of these spores and other germs & parasites. In their initial campaign to tackle this issue, operators had to wear what looked like hazmat suits to spray the approved disinfectants and cleaners. The process became highly unpleasant for workers, yet after months of chemical battles, the mold problems persisted. Losses accumulated to quarterly with the plants 2-3 month growth & harvest cycle. The management and investors demanded a solution.

While operating margins remain solid, their competitors were not taking a break. With losing 50-70% of their quarterly crop, they needed immediate results. Unless our *Customer* found a permanent solution to the crop-killing mold, the prospect of closing operations began to take shape.

Source Discovery

To hunt for the source of the mold, we initialized a thorough facility inspection. Members of their custodial team, crop specialists, and 4EverGuard began to inspect roofing, wall off-sets, insulation, and crawl spaces within the numerous rooms. We also examined their cleaning methods, air flow, and containment protocols.

The 4EverGuard team identified numerous areas within the facility feeding mold growth. Using an ATP meter*, we were able to confirm that the areas were contaminated. While the ATP meter may not tell us what type of mold we're measuring or how pervasive it is, it confirms that the area is contaminated and that the contamination is has been spreading throughout the facility.

* ATP refers to an adenosine triphosphate test to measure & reveal microorganisms on a surface.



We discovered that the solution involved more than surface disinfection and treatment with *Titania*. The appropriate solution involved deeper and broader cleaning of mold, disinfection of areas, repair of wall, ceiling & insulation failures, and appropriate & continuous air filtration. Our Clean-Sanitize- Protect (CSP) process would need to be implemented to have the long-term results that *[name withheld]* demanded.

Here are just some of the building issues that were perpetuating the mold issue:

1. Wall failures were discovered while walking the greenhouses' perimeter
2. Spaces between the growing rooms & the ceiling had hundreds of cubic feet of decrepit, moldy insulation. The insulation became wet due to the roofing failures & leaks.
3. They were using specified MERV-13 filters throughout the operation. The specified filters were not effective in capturing mold spores, and the heavy media was overworking the HVAC system. The filters also were poorly seated, allowing unfiltered air to circumvent the filter.
4. We observed numerous areas throughout the facility, outside of the grow rooms, where visible mold growth appeared on walls.
5. Crawl spaces between greenhouse walls exhibited large patches of active mold growth.
6. Standing in two of the sizeable grow rooms, we shut off the lights and discovered gaps at the base of the walls where light, and mold, entered.
7. During the inspection, we noticed likely contamination by team members who traveled throughout grow rooms with plants in mid-growth cycle and late stage pre-harvest cycle. Their PPE protocol needed attention.
8. We noticed their current remedy used to kill visible mold, ZeroTol 2.0, was effective in killing existing mold but presented challenges:
 - While it's GHS toxicity rating was low, it still contains acetic acid and in an enclosed area presents health challenges for team members due to its daily and prolonged use.
 - While the ZeroTol kills mold on the spot & is safe around plants, it did nothing for prevention or reoccurrence issues. Once the surface was sprayed and the mold killed, within minutes the same area was ready for mold spores to land from air flow or contact exposure.
 - ZeroTol 2.0 was only sprayed on visible mold. Their team had no testing of surfaces daily, and ZeroTol should not be sprayed on ALL surfaces.



The Work

1. A third-party contractor repaired exterior walls, roof leaks, and various gaps in walls and doors.
2. Removal of compromised insulation atop the grow rooms. Once removed, we coated the cavity with *Safe-T-Gard* using an Omnifog applicator. This disinfection was repeated for three days in a row. Contractor replaced fiberglass insulation with a spray urethane foam insulation. A final fogging of *Safe-T-Gard* was performed. Numerous surfaces in the surrounding areas were tested with a Hygiena ATP meter, proving success, and staging surface for *Titania*.
3. The maintenance team purchased *Safe-T-Gard* to kill mold throughout the common area, as it both disinfects and cleans away particles, as opposed to previous solutions which only disinfects, and did not clean or remove dirt. Place any physical mold in a bio bag, secure and remove from premises. (Especially in the created hallway that we mentioned).
4. Replace all MERV*-13 filters with ElectroGrip Filters by 4EverGuard which use a carbon technology proven effective in removing mold and other parasites. The filters are rated MERV-8 and were fitted & seated correctly, lasted longer, and put less stress on the HVAC.
5. Utilized our C-S-P process in the two rooms which produced the highest crop failure rates. *What is C-S-P?*
 - Clean* from ceiling to floor using *Cyclone* multipurpose cleaner
 - Sanitize* room using *Safe-T-Gard*; re-test spots throughout room with the ATP meter, ensuring sanitary surfaces, readying for final state:
 - Protect* every surface in room with *Titania*, with its active hydroxyl radicals preserves the hospital-grade disinfected surfaces for years. *Titania* protects all piping, platforms, walls, doors, ceiling, vents and flooring and doesn't allow pathogens to attach or grow on surfaces. *Titania* is sprayed onto surfaces using our proprietary Omnifog applicator and handheld blower.
6. All walls and crevices in greenhouse were sealed by the contractor.
7. We ended by establishing a protocol for entering and leaving growing rooms. Workers and visitors must be informed and trained in adhering to this policy.

The work was completed near the end of October 2022.

* *Minimum Efficiency Reporting Values, or MERVs, report a filter's ability to capture larger particles between 0.3 and 10 microns (μm)*



The Results

Our customer reported substantially positive changes in the following quarter, after we eradicated mold growth throughout their facility. Before we were asked for our solution, several of their grow rooms exhibited 50-70% failure rates due to contaminated cannabis, requiring them to destroy over \$750k worth of inventory. After removal of the mold and any remaining spores, the customer **reported 80-100% pass** on quality assurance and compliance tests. They have continued to utilize *Safe-T-Gard* in their cleaning schedule and enacted plans to cover the remaining dozens of rooms with *Titania*.

We want your business. Let's chat about your facility's cleaning, odor & disinfecting challenges.

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