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██████████ Dispensary Greenhouse's

Degradation Efficacy Pilot Clean Air Zone Ag System Bacteria and VOCs



7-20-2022



Overview:

Clean Air Zone Ag (CAZAG) preformed an extended pilot program to test: the efficacy of bacteria mitigation and the overall reduction of Volatile Organic Compounds (VOCs). The testing was completed using CAZAG Air Purification units and was conducted at the [REDACTED] Dispensary Greenhouse located in [REDACTED] S, New Jersey. [REDACTED] mission is to produce the highest quality medicinal cannabis possible. This intense focus on quality means they are always striving to improve their stellar products. [REDACTED] Dispensary constantly brings new cultivars to their patients, who seek diverse means to alleviate their symptoms and improve their quality of life.



The testing was conducted over a period starting on 5/5/22 and ending on 6/13/22. CAZAG was assigned different locations within the facility of where to place the air purification units. They were distributed over a total of six rooms. These were designated as test areas. Details of the testing protocol and data analysis are outlined in this document. It should be noted that the focus of this pilot study was bacteria and VOC remediation. However, the CAZAG units are designed to deal with a wide spectrum of air pollutants including but not limited to bacteria, molds, viruses, and particulate matter.



Procedure:

A total of six rooms in the facility were designated in which CAZAG would conduct the study. Locations were as follows: Drying Room, Packaging Room, Trim Hallway, Harvest, Moms & Veg (clone room), and Flower Room. As referred by their name throughout this report

Before any equipment was installed, baseline testing was performed in all the assigned test areas to establish a base level of bacteria and VOCs. Baseline testing was conducted on 5/3/22 to 5/5/22 as outlined in the testing protocol section below. Upon completion of the baseline testing the CAZAG Air Purification units were activated in each of the locations specified and allowed to run uninterrupted from 5/5/22 to 6/13/22. There was a total of 13 units distributed throughout the locations that were specified above (see floor plan). Additional air quality testing was completed as detailed below.

Testing Protocol:

Testing for bacteria was conducted using two methods:

- I. **Collection Method 1:** A calibrated air pump was used to draw 150L sample of air through an M-Trap[®] air cassette. These cassettes then were independently analyzed by Assured Bio Labs. Assured Bio Labs is an AIHA-LAP, LLC accredited laboratory for testing mold, bacteria, and coliforms using traditional microscopic and DNA-based (MSQPCR) analysis and is located in Oak Ridge, Tennessee. Assured Bio Labs processes and interprets samples from homes, office buildings, schools, hospitals, micro-sensitive manufacturing facilities, and other buildings.
- II. **Collection Method 2:** “WhisperCare[®]” continuous air monitoring systems were used to collect air samples over an extended period. The WhisperCare[®] units also use M-Trap[®] cassettes. These then were also independently analyzed by Assured Bio Labs.



Testing for VOCs was conducted using this method:

- III. **Collection Method 3**: RAE Systems ToxiRAE Pro PID a handheld VOC monitor that quickly detects and monitor over 300 VOCs. Data was extracted from device and analyzed by David Podmayersky, Chief Science Officer.

Testing protocol required the collection of air samples using all the above methods to establish baseline counts as detailed below:

1. Air pump samples were collected from all the locations specified in the Procedure section above. These samples were taken on 5/3/22.
2. One “WhisperCare” unit was set up in the *dry room*. This unit was activated on 5/3/22 and left to run until 5/5/22 (a 3 – day continuous air sample using collection Method 2).
3. VOC testing using collection Method 3 was conducted on 5/3/22. Samples were taken over a 5-minute period in all locations specified.

To establish efficacy of the CAZAG units for bacteria and VOC mitigation the following testing was done after the CAZAG units were in operation for a 2- week period:

1. Air pump samples were collected from all locations on 5/19/22 using collection Method 1.
2. A “WhisperCare®” unit was once again set up in the *Dry Room* location
3. VOC samples were taken throughout all locations once again using collection Method 3. Data was extracted and analyzed. This was taken on 5/19/22 as well.

The CAZAG units were given another week to operate before another round of testing was done. The testing was as follows:

1. On 5/26/22 another round of air pump samples was taken once again from all locations using collection Method 1.

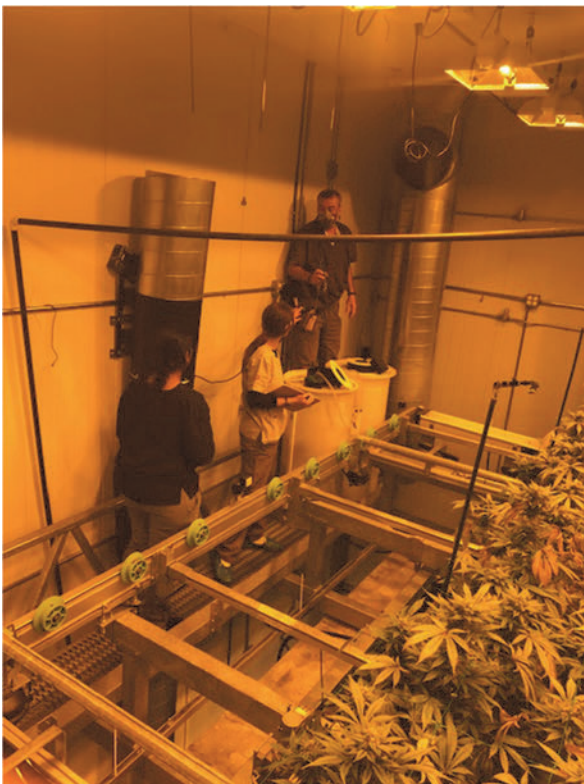


2. A “WhisperCare®” was set up in the *Dry Room* a sample was collected using Method 2.
3. VOCs were once again measured using collection Method 3. Sampling was taken on 5/26/22.

To conclude the study for efficacy of the CAZAG units, they were given a final 2 weeks to perform before final test samples were collected. Testing proceeded as follows:

1. Air pumps samples were taken from all previous specified locations. These were collected on 6/9/22 using collection Method 1.
2. A final “WhisperCare®” sample was taken from the *Dry Room*. Sample was taken for a continuous four-day period from 6/9/22 to 6/13/22. This was done using collection Method 2.
3. Using collection Method 3, VOC data was gathered at each specified location. These tests were also conducted on 6/9/22. Data was extracted and analyzed.

The CAZAG Air Purification units were left running at the [REDACTED] Dispensary Greenhouse to not disturb the overall air pollution reduction in the facility. The data was collected and analyzed. A summary of the analysis is found below.

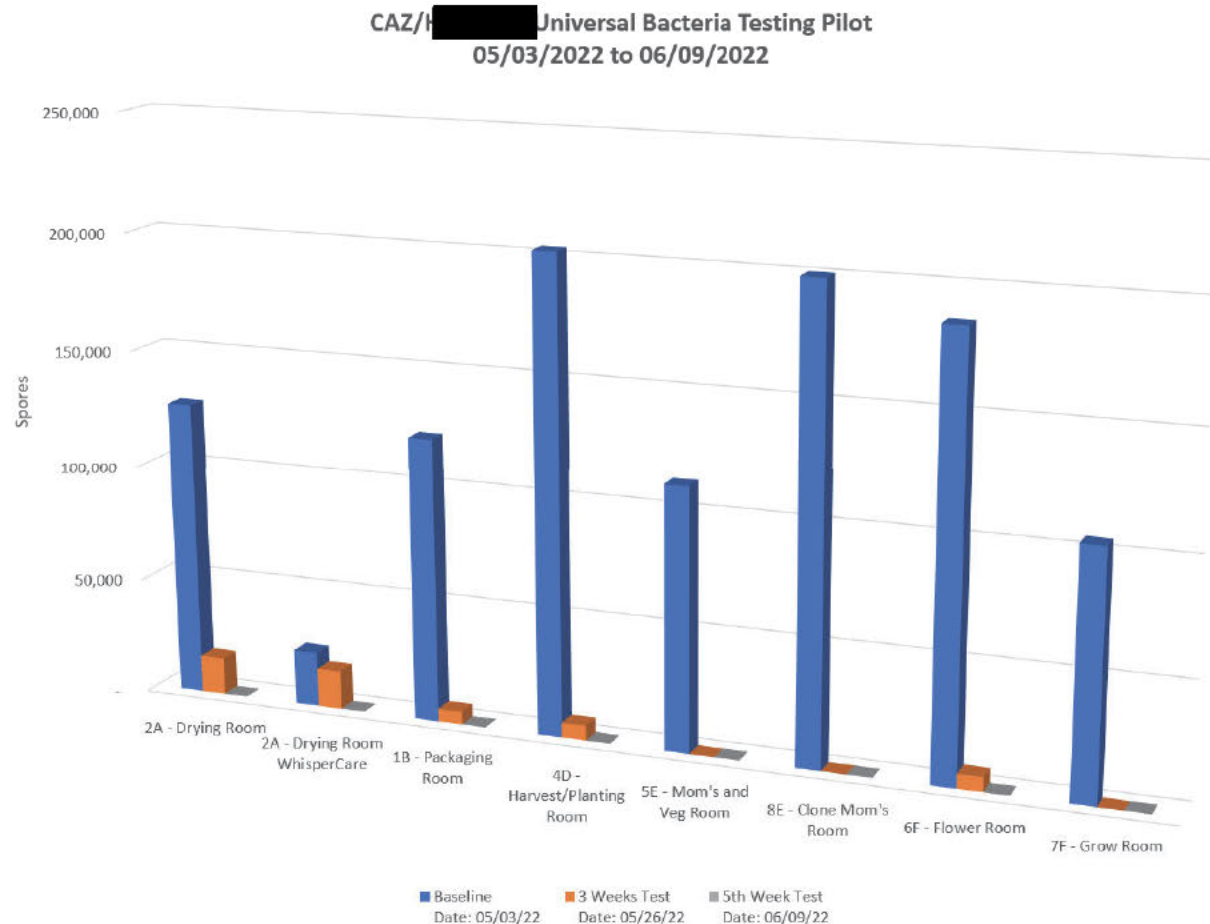




Data Analysis - Bacteria:

The key metric used to determine the bacteria mitigation effectiveness of the CAZAG air purification system is a comparison of the total bacteria count of the baseline data versus the end of the pilot post data. Week 3 testing was included to show overall reduction throughout the pilot. The dash in data signifies the bacteria was reduced to non-detectable levels. This data was collected by using sample Method 1 and Method 2.

CAZ/████████ Universal Bacteria Testing Pilot			
LOCATION	Baseline Date: 05/03/22	3 Weeks Test Date: 05/26/22	5th Week Test Date: 06/09/22
2A - Drying Room	126,874	15,925	0
2A - Drying Room WhisperCare	23,633	16,588	0
1B - Packaging Room	121,798	5,435	0
4D - Harvest/Planting Room	202,896	6,312	0
5E - Mom's and Veg Room	112,249	0	0
8E - Clone Mom's Room	200,153	0	0
6F - Flower Room	185,719	6,312	0
7F - Grow Room	104,865	0	0



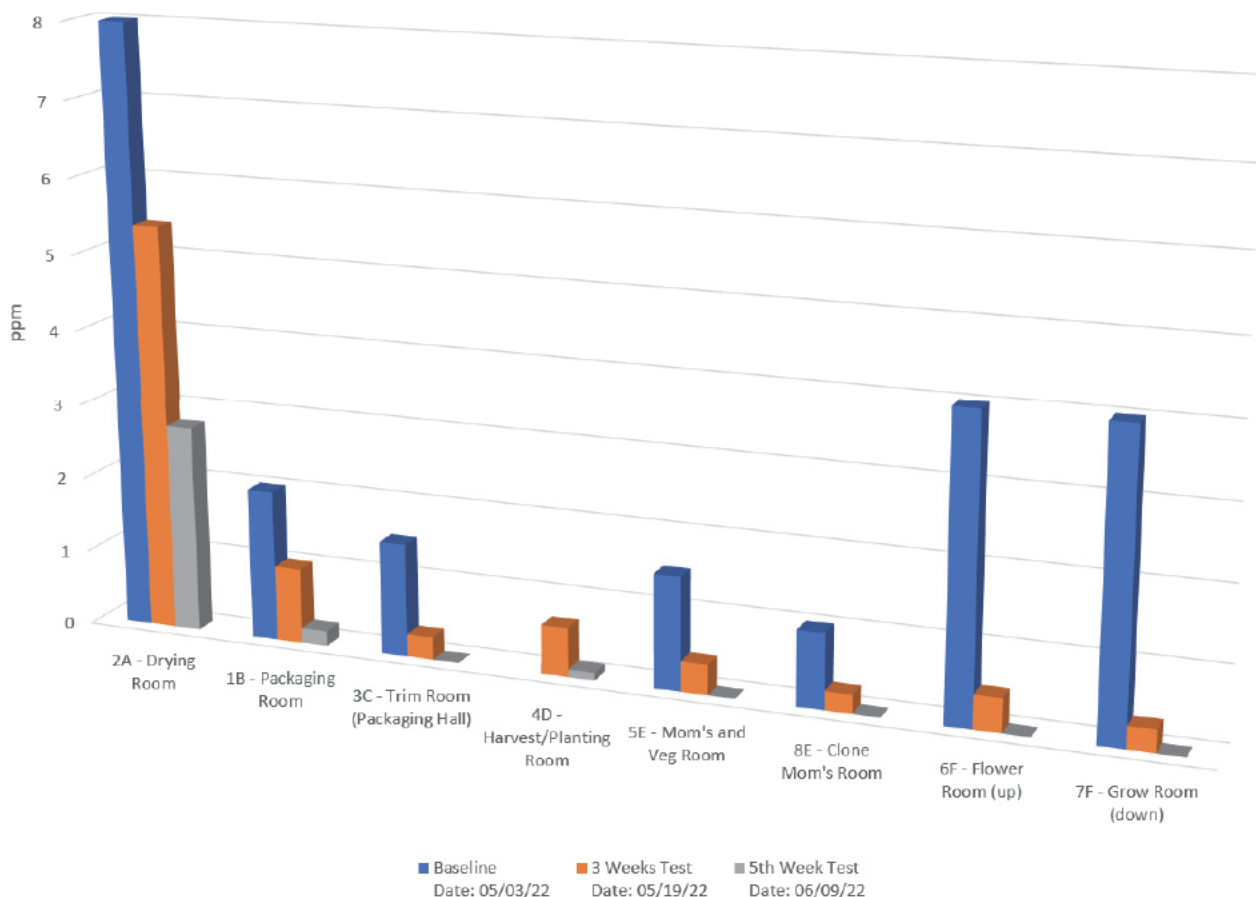


Data Analysis - VOCs:

The key metric used to determine the VOC mitigation effectiveness of the CAZAG air purification system is a comparison of the total VOC levels from the baseline data versus the end of the pilot post data. Week 3 data was included to show the reduction in VOCs over a period of time. This data was taken using sample Method 3.

CAZ/ [REDACTED] VOC (ppm) Testing Pilot			
LOCATION	Baseline Date: 05/03/22	3 Weeks Test Date: 05/19/22	5th Week Test Date: 06/09/22
2A - Drying Room	8	5.4	2.75
1B - Packaging Room	2	1	0.2
3C - Trim Room (Packaging Hall)	1.5	0.3	0
4D - Harvest/Planting Room	None Taken	0.65	0.1
5E - Mom's and Veg Room	1.5	0.4	0
8E - Clone Mom's Room	1	0.25	0
6F - Flower Room (up)	4	0.45	0
7F - Grow Room (down)	4	0.3	0

CAZ/ [REDACTED] VOC (ppm) Testing Pilot
05/03/2022 to 06/09/2022





Conclusion:

In all specified locations there were significant reductions overall. In both bacteria as well as VOCs. In the *Dry Room*, which was considered a problem area, the bacteria were remediated to non-detectable levels. There were also huge reductions in the VOC levels, many locations were reduced to 0ppm. The *Dry Room* VOC levels were reduced more than 70% even with the heavy pollution loads.

In addition to the bacteria and VOCs reduction, anecdotal evidence was provided by some staff members stating they could feel the difference in the air quality and the pollution seems to not be affecting them as much. The evidence shows how the CAZAG Air Purification units will help create a safe and healthy work environment. In addition to all the beneficial aspects of the CAZAG units that can be utilized to help maintain better crop fulfillment. We look forward to assisting [REDACTED] Dispensary in achieving high standards in indoor air quality.

