

STORAGE & STABILITY STUDY

TerpLoc[®] Microclimate Mechanisms & Composition

Data provided by



June, 2023



Background

In late 2022, Grove Bags commissioned a study with Veda Scientific, a California-based cannabis testing laboratory specializing in advanced compound analysis and experimental design, in order to examine the effectiveness of TerpLoc® compared to other storage devices and conditions. Grove Bags has previously employed independent, third-party testing to demonstrate the effectiveness of TerpLoc® as recently as 2017, wherein it was found that Grove Bags are more effective at preserving terpene content than other storage methods.

As the industry has matured, additional resources have been made available to further analyze the wide array of volatile compounds found in cannabis. For the purposes of this study, Veda Scientific utilized a highly specialized two-dimensional gas chromatography system (2D GC) to measure *all* of the volatile content of cannabis, including terpenes, thiols, esters, and dozens of other compounds.

Experimental Design

A 12-week curing and storage study was conducted using two chemotypically distinct strains - GG4 and MAC. For each strain, dried samples were divided evenly among five Grove Bags and five Mason jars, so that each container had 2.5 pounds of flower. At regular intervals (Weeks 1, 4, 8, and 12), samples were analyzed for N₂, CO₂, and O₂ retention, moisture and water activity, cannabinoid content, terpene content, and an untargeted 2D GC/MS analysis, enabling a broader array of component qualification.

Summary of Findings

Results from the 12-week study determined, conclusively, that flower cured in Grove Bags *more effectively retained the full spectrum of volatile compounds found in cannabis compared to glass jars*. Additionally, Grove Bags were found to create an elevated CO₂, lower oxygen environment.

A notable distinction between these newest results and the results of previous studies is the inclusion of untargeted 2D GC/MS analysis, enabling the measurement of a much broader array of plant components. As shown in prior results, TerpLoc® was again more effective at retaining terpenes and THC, and with the inclusion of additional variables in this most recent study, it is apparent that *Grove Bags provide a better environment for the preservation of the plant's full spectrum of volatile compounds*.

The TerpLoc® MicroClimate

Some notable finding of this recent study resulted from examining the mechanisms by which TerpLoc® bags create and maintain their unique atmospheric conditions, and the composition of the resulting microclimate. During the post-harvest curing phase, the ability to selectively retain certain gases and compounds while allowing others to diffuse throughout the product and surrounding atmosphere is shown in the data to more effectively retain both cannabinoids and terpenes.

As with any natural product whose value is tied to volatile compounds that deliver flavor, aroma, or psychoactivity (e.g. coffee, hops, fragrance florals), cannabis is susceptible to damage resulting from oxidation. The ability then to reduce, replace, or redistribute oxygen within the storage environment is vital to retaining product value. This also holds true for the control of humidity and moisture.



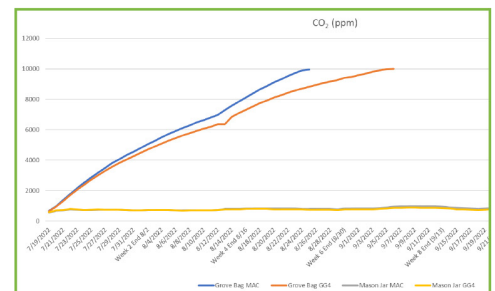
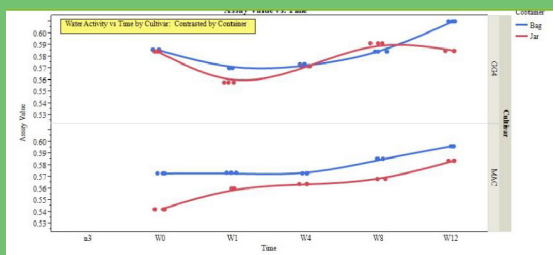
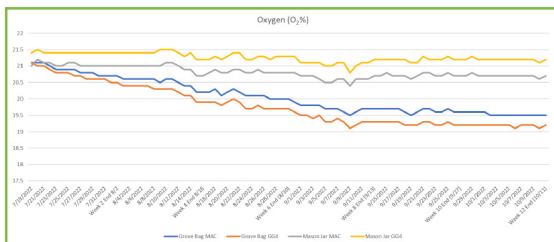
The TerpLoc[®] MicroClimate

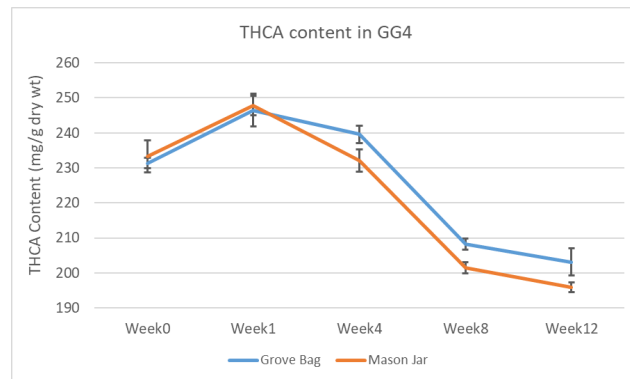
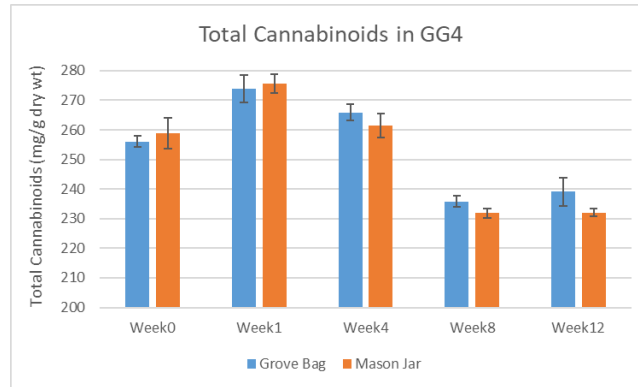


Consistently Higher Water Activity Levels

Lower Levels of Oxygen Retained

Increase in carbon dioxide





At their core, historically used curing and storage methods attempt, through various manual or additive mechanisms, to accomplish the same task - regulate, modify, and maintain specific atmospheric conditions to maximize yield of volatile compounds. Accomplishing this consistently by relying on manual or active methods of atmospheric modification proves a daunting challenge to cultivators, especially when attempting to scale operations. However, TerpLoc® exhibits an ability to create and maintain unique environmental conditions within the bag that readily produce a finished product with higher overall potency across a full spectrum of compounds. This is accomplished conveniently, with no added manual labor or active modifiers, and instead relies on advanced material properties to allow the input plant material to self-regulate under ideal conditions.

References

Veda Scientific. "Grove Bags Storage & Stability Study 2022/2023." Lompoc: California, 2023.



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