Debby Wadsworth
Consultant & Freelance Writer
DW-Writer.com

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Charts, Product Images

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Testimonial:
"You (Debby) did an outstanding job and we are very pleased with your work. I would like to have my team work with you (Debby) again on another white paper." Brian Rice, Boveda Inc.

You Created Your Own Special Aroma
It’s time to invest in saving it

The cannabis industry is evolving as the demand for craft/connoisseur products continues to grow. People are becoming more educated. They search for cannabis with a unique aroma and flavor, like finding a fine wine. As a result, cannabis growers realize it's time to start changing how they handle production and storage. It is no longer just about creating a unique aroma and flavor but about preservation too now and in the long-term.

Every grower approaches the growing process a little differently, with the same goal of having their own unique, nearly proprietary aroma and taste. Why? Because many customers buy cannabis-based upon aroma and flavor. It has been one of the top decision factors in purchasing cannabis for decades.

Customers also expect a consistent experience when using the product each time, every time. Meeting this new demand has prompted some growers to start changing where they invest in their process.

Growers are Changing Focus

Traditionally growers have invested their time, money, and muscle in pre-harvest activities focused on aroma and flavor development. That need is still there, but product consistency, stability, and health have also grown in popularity. Growers want to learn more about the process and production techniques. They also want to grow less and get more out of what they already produce and become more profitable businesses.

Companies in the Cannabis industry are reexamining their processes and outcomes. They realize it is time to start investing in post-harvest improvements. Specifically, finding ways to maintain and strengthen their uniqueness by preserving terpenes. Also, stop losing yields during the curing, packaging, and storage stages. They also want to increase their brand's preference, demand, and sales for a better bottom line with a better investment return.

In the post-harvest stages, growers have been relying on traditional techniques for environmental management. Rudimentary examples would be using tortillas, orange peels, or wet paper towels to add moisture to cannabis. More sophisticated ways are done using food-safe aqueous glycerin solution pouches or humidity control pads. While these methods all provide some level of benefit, they fall short in maintaining cannabis health as well as locking in their plant-specific unique aroma and terpene profile. Traditional techniques will not deliver the consistency customer's demand.

Growers are looking for better ways to produce and maintain quality cannabis. They need something that will lock in that aroma, reduce terpene loss, and improve shelf life. The answer is finding an approach or system for the post-harvest stages that do a better job at environment management.

Where Does Aroma Come From?

A significant contributor to how a cannabis plant smells comes from terpenes produced in the plant's appendages called trichomes. Keeping trichomes and terpenes in an optimum environment where they are hydrated and healthy leads to higher product quality and sales.

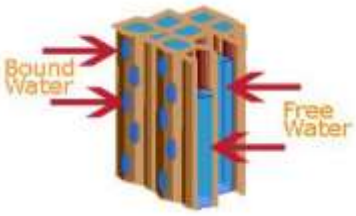
If trichomes are over-dried, terpenes will evaporate along with flavor and your bottom line. Overhydrating can lead to mold growth, potentially putting customer health at risk.

Trichome health is critical to Terpene preservation in cannabis

Variables That Affect Terpene Aroma

Several variables affect trichome (and, therefore, terpene) health, quality, aroma during curing, and storage. Two key ones are moisture content and water activity (aW). Managing them not only enables growers to get more out of every crop, but it also ensures the product is safe for consumption. Inhibiting water activity has been established as an effective way to hinder the growth of microbes and metabolism of microbe-associated toxins, according to ASTM D37 D8197 from the American Society of Testing & Materials (ASTM).

Moisture Content



There are two kinds of water present in plants: "free water" and "bound water." Free water is the water within the plant that can be extracted by squeezing, cutting, or pressing your product. Bound water is water that is found within the plant cells and is bound to the cell walls. Because the water is bound, it cannot be easily removed without incurring damage to the trichome and terpene. The two combined are called "moisture content" of the cannabis [JN1]. Moisture content is how most cultivators test their products. While it works to a point, it is not the most precise way to manage moisture content. Using it can create a contaminated product not safe for consumption.

Water Activity (aW)

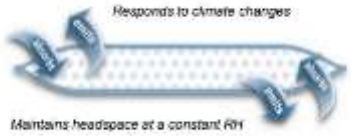
A more precise way to determine moisture content is Water Activity (aW). Monitoring aW is the industry standard set by the ASTM. In ASTM D37 D8197 it states for consumption safe cannabis you need to maintain an aW between 0.55 aW – 0.65aW.

The aW relates directly to the water available (in liquid form) to the microbe. An aW measurement tells you how much water is not chemically bound within the product. Monitoring it is important to keep trichomes and terpenes healthy. If kept too high, mold and fungus can begin to grow, compromising customer safety. Kept too low, aroma, flavor, and your bottom line will evaporate and leave you with a low-quality product.

Creating the Best Environment

The marketplace is getting more and more competitive, with new growers every day entering the market. The only way for growers to boost demand and sales without growing more cannabis is better environmental control. Staying within the recommended storage guidelines delivers a higher quality product, sealing in the terpenes, and strengthen the aroma. It provides an even more unique and better customer experience. The two approaches used most often during the curing and storage stages of cannabis production are called 1-way and 2-way RH Control.

1-way RH Control



The 1-way approach adds and removes water, but not both at the same time.

In the 1-way RH Control approach, moisture can be either added or removed in the cannabis environment, but not both. That is why it is called a 1-way approach. Organic materials like orange peels are added to the environment for increasing humidity within the headspace (space between the product and container). How much moisture they add depends on what they're using and how long they are left in the environment. For removing moisture, growers rely on silica or glycerin-based packets used in the food industry. How much is removed is once again dependent upon what they're using and how long they are left in the environment.

While the 1-way approach does either add or remove moisture, it can be labor-intensive, especially when maintaining the 55% and 62% RH range for customer safety. Often growers do not have the time for the necessary continuous monitoring, measuring, adding, and removing. Plus, the cannabis environment is ever-changing during curing and storing caused by moisture fluctuations. Keeping up with changes manually and managing them is a slow process that fails to bring the product into an RH equilibrium.

2-way RH Control

A more advanced way to approach cannabis environment control is called 2-way RH Control. It is a system created and patented by Boveda that solves the issues with 1-way humidity control and more. Boveda packets provide environmental control by allowing water to go two ways. The packets either add or remove water to maintain the optimum RH.

The 2-way approach brings RH to within 1-2% of an ideal environment.

The product controls RH so precisely, it strengthens the aroma by producing a monolayer of water on the plant. This in effect creates a shield around the trichomes and terpenes present inside. When this shield is broken, the terpenes are released when a person uses the product. The patented design allows water vapor to pass through a special film very quickly. While it moves through, moisture is added or removed as needed to reach equilibrium. This approach keeps the environment at the ideal RH, whereby terpenes are preserved.

Boveda will reach its designated RH within 24-48 hours, depending on the container. Other 2-way systems can take as long as 72 hours. How does it work? Inside Boveda is salt, pure water, and a food-safe thickening agent. The salt-based solution is sealed in Boveda's patented vapor phase osmosis membrane. As water vapor is released from or absorbed into the membrane, the water to salt ratio changes. The salt dissolves when more water is absorbed. The salt precipitates or becomes a solid again when more water is released.

Using nature's original preserver, salt, Boveda dials-in and precisely maintains your container's humidity levels, much like a thermostat. Boveda may cost a little more than traditional methods, but in the long-term, it will pay for itself by increasing the amount of sellable yield and locking in your unique aroma that leads to preference.

In summary, to achieve your goal of creating more demand, preference, sales, profits without growing more crops, changes will need to be made along with investment in the post-harvesting stages of the process. In your process, techniques will also need to focus on better environmental control to improve trichomes and terpenes' health. The combination will lead to a better return on your investment.

Note: The white paper also includes several pages of results from a study done by Boveda. The information is not included since the study has not yet been released.