

Proper cannabis post-harvest handling is necessary for preservation of aroma, reduction of microbial contamination and shelf stability. Equilibrium moisture content (EMC) refers to the moisture content at which a material (in this case, cannabis flower) reaches a stable balance with the moisture content of the surrounding environment. In other words, it's the point at which the buds have absorbed or released enough moisture to match the humidity of their surroundings.

### **How do we achieve EMC?**

We guide EMC by controlling the Vapor Pressure Deficit (VPD). VPD is a critical concept in the context of drying plant material, particularly in post-harvest handling of cannabis. It refers to the difference in vapor pressure between the air and the plant's internal moisture content. VPD is used to assess the drying conditions and to determine how efficiently moisture is being removed from the plant material. Temperature and humidity influence this calculation greatly. Warmer air can hold more water vapor, so as the temperature rises, the vapor pressure of water in the air increases. Additionally, plant material contains water which exerts its own vapor pressure and is dictated by the moisture content of the plant and the temperature of the plant material. The VPD value is typically expressed in units like kilopascals (kPa) or millibars (mb). It represents the "drying potential" of the air, meaning that a higher VPD indicates that the air can effectively remove moisture from the plant material because the air is drier relative to the plant.

In the context of drying plant material, maintaining an appropriate VPD is crucial for efficient and uniform drying. If the VPD is too low (meaning the air is nearly saturated with moisture), it can slow down the drying process, potentially leading to issues like mold and spoilage. Conversely, if the VPD is too high (very dry air), it can lead to excessive drying rates and potentially damage the plant material or reduce its quality.

Traditionally in cannabis post-harvest, "curing" is a step always implemented yet not completely understood. Research produced by the Cannabis Research Coalition validates that the curing step does ensure equilibrium is met throughout the cannabis bud by giving time for the moisture to homogenize throughout the sealed container. In a properly equipped room and by the control using VPD, this step can be achieved in a drying room. Although, if the drying environment is not stable and has wide swings of humidity or temperature, rehydration can occur. Rehydrating flower can lead to microbial infection, spoiling of terpenes, and ultimately poor-quality product.

### **How do I put this science into practice?**

Within the drying room the manipulatable metrics are temperature and humidity. As shown in the graph below, a higher VPD (warm and low relative humidity) will dry the buds faster while a lower VPD (cooler and with a higher relative humidity) will dry the buds slower. Maintaining a VPD around ~0.8 will provide a perfect rate of drying.

study conducted by the Jim Faust Laboratory at Clemson University, Figure 4, shows how temperature and humidity (VPD, vapor pressure deficient) affect drying time. Interestingly, the traditional metrics fall directly in line with experimentation.

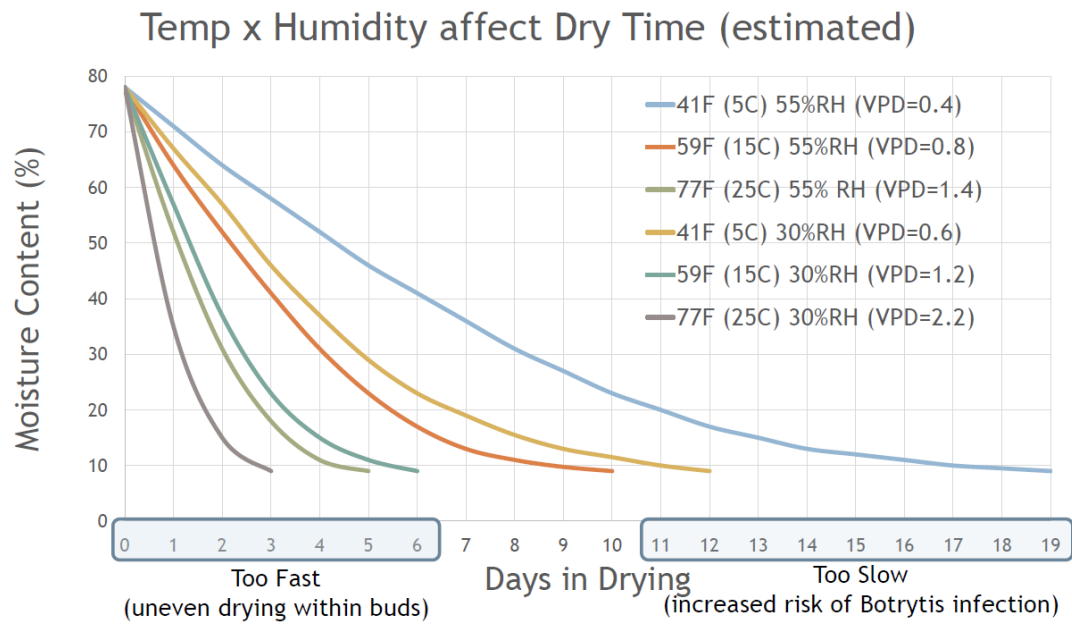


Figure 1. Jim Faust Laboratory, Clemson University. Cannabis Research Coalition.