

Cannabis and hemp plants are fertile producers of a dazzling array of chemical compounds, many of which have therapeutic effects in the human body. At the heart of this production system are the trichomes, which cover the surface of female cannabis plants throughout their blooming stage.

[Trichomes](#) are tiny, translucent, crystalline structures with bulbous heads on their ends. They coat the leaves, buds, and flowers of cannabis and hemp plants, glistening like a layer of morning dew. It is only on closer examination that the real nature of trichomes is revealed as fully integrated appendages that grow directly out of the plant's body.

The appearance of trichomes during reproduction is purposeful. Inside their translucent bodies, trichomes are busy producing abundant supplies of the more than 400 compounds that comprise the chemical profiles of cannabis plants. They perform this activity with extraordinary proficiency, creating impressive amounts of the essential cannabinoids, terpenes, and flavonoids that cannabis and hemp harvesters, manufacturers, and consumers covet.

## **Trichomes Explained**

There are three types of trichomes found on cannabis plants. They are known as bulbous, capitate sessile, and capitate-stalked trichomes, in order of increasing size.

At a diameter of 50-100 micrometers, the capitate-stalked trichomes are the only ones large enough to be seen by the human eye. These larger trichomes are the most advanced and efficient cannabinoid and terpene producers, although all three types contribute to this natural bounty.

Trichomes are often referred to as the 'factories' of the cannabis plant. This works as a metaphor, but it fails to capture the fluid, organic nature of trichome activity.

What trichomes do is more transformative than mechanical. They take raw cellular elements called plastids and vacuoles up through their stalks into their glandular heads, where they process and convert them into medicinal-grade substances, as well as other complex, nutrient-rich compounds. Eventually, the glandular heads will fill to the point of bursting with cannabis- and terpene-rich resins, which can be collected in abundance once the cannabis or hemp plants are harvested.

Human beings can benefit from the consumption of trichome-produced chemicals. But their impact on potential predators is quite the opposite.

Typically, insects and birds would be attracted to cannabis flowers in bloom. But they are repelled by the bitter taste and intense aroma of the sticky residue that soaks through trichome surfaces. From the standpoint of the cannabis plant, the trichomes perform a protective role, in essence, acting as guardians for flowers that are left free to blossom without interruption.

## **Trichomes at Harvest Time**

Like many other plants and plant appendages, trichomes rely on color to signal when their biochemical activities are complete. Or more accurately, cannabis and hemp cultivators track the progress of the trichome “factories” based on their changes in color, timing their harvesting activity to ensure maximum yield in quantity and quality.

As their life cycle and production cycle progresses over the course of a few weeks, trichomes will transform from translucent to milky white, to cloudy white, and finally to a rich amber hue. Depending on the requirements and preferences of the individual farmer, harvesting will take place somewhere between the third and final progression: cloudy white trichomes generally produce the most potent cannabinoids and terpenes, while amber-colored trichomes will provide the most abundant yield (with just a small decline in potency).

Most harvesters spring into action as quickly as possible after the transformation from white to amber is complete. After trichomes turn amber, their contents will begin to degrade in quality, so there isn't much time to act.

The production levels of trichomes will vary based on genetics and exposure to broad-spectrum sunlight, plus the overall health of their plant hosts. Despite their protective qualities, trichomes are quite sensitive and can be damaged by excessive exposure to heat, intense light, or environmental pollution. They are most susceptible to physical contact and can be broken or dislodged if they are handled roughly before or during harvesting. Consequently, great care must be taken to avoid causing damage to trichomes during the trimming, drying, and curing stages.

When trichomes are correctly handled, they will deliver impressive payloads when subjected to various extraction techniques. It is during extraction that cannabinoids and essential terpene oils are cleanly and neatly separated from their trichome “factories,” in a concentrated form that can then be further processed to create extract-based hemp and cannabis products.

## **New Extraction Techniques Unlocking Full Trichome Potential**

The sensitivity of trichomes has always challenged harvesters, and extractors looking for high-quality and prodigious yields. Recently, extraction equipment manufacturers have been experimenting with flash freezing and deep-freezing technology as a method for efficient trichome separation and preservation. This approach can remove the risk of physical damage that is inherent with other trimming, curing, and drying techniques by consolidating everything into one clean and rapid process.

Two companies have introduced new low-temperature extraction systems in 2020. One is the groundbreaking [CRS 2000 CryoMass Refinement System](#), which is being marketed and sold by Precision Extraction Solutions of Troy, Michigan. Initially developed by Precision partner CryoCann USA, the CryoMass system bathes whole cannabis and hemp plants in liquid nitrogen, which instantly freezes and separates the trichomes from leaves and flowers. Drying and curing are accomplished simultaneously and with high levels of efficiency, producing a dry

sift product that will be loaded with THC or CBD, depending on whether the plants used were cannabis or hemp.

The other new extraction methodology was developed by Tracee McAfee and Greg Baughman, who call their technology (and their company) [Cryo Cure](#). Like the CryoMass system, Cryo Cure machines eliminate the need for harvested trichomes to be dried and cured, which both technologies accomplish through a deep-freezing process. In the case of Cryo Cure, it is the whole flower of the cannabis plant that is frozen, with fully intact trichomes incorporated into the final product.

## **The Special Alchemy of the Trichome**

From the perspective of cannabis and hemp consumers, trichomes are the ultimate source for good. They are the true manufacturers of THC, CBD, and all the other potent chemical compounds that cannabis plants provide.

Trichomes are a legitimate marvel of nature. They perform a special kind of alchemical magic, creating a rich and nourishing golden resin from humble cellular materials. Even the most refined cannabis product can be traced back to their processing and synthesizing capacity, which gives them a foundational role in the ever-expanding cannabis and hemp industry. Harvesters and extractors who treat their trichomes well will reap ample rewards for their efforts.