

CANNABIS INTELLIGENCE BRIEFING

Flower: The Foundation of the Cannabis Industry



Executive Summary

Flower: The Foundation of the Cannabis Industry

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Branding is important for product survival and the trending increase of branded retail flower sales will help to stabilize the segment's share of overall consumer spending

Letter from the Editor

Which is the key trend facing cultivators of cannabis: Is it the tripling of worldwide demand over the next five years as forecast in our cultivation-demand model? Or plummeting prices, such as the halving of the average wholesale price seen in Oregon this year, tracked by Cannabis Benchmarks?

I would argue the “glass-half-full” side of the debate. Falling prices were inevitable as the “illegality premium” disappeared from a pound of pot, but it was far from certain that demand would grow enough to turn an underground economy into a profitable legal industry. Thanks to a consumer-packaged-goods revolution in a few adult-use states, it looks like demand will do just that.

If cannabis hadn’t moved beyond the simple business of trimming buds and bagging them up for sale, where would the margin be in a legal industry? All the value being added in the illicit trade consisted of the risk-taking by growers, distributors and retailers that were breaking laws to deliver a basic product. There was word-of-mouth marketing around countries-of-origin and domestically grown strains, but that was it—no branded product lines, no professional packaging, pricing by weight.

In the 2000s, enterprising dispensaries in medically legal states and a few entrepreneurs thinking ahead to adult-use legalization began bringing product development ideas from the broader economy—chocolate bars, gummies, vaping and the like—into the cannabis business. Some began to build brands with product lines, sometimes across categories, with high-end form-factor and packaging designs. For them, the crumbling price of their key raw material was nothing but good news.

Retailers benefit too from lower flower prices, especially since adult-use legalization typically brings margin pressure from increasing fees, taxes and regulatory costs. Long time customers in particular “know what the price should be” and have the illicit-market option for flower purchases if they don’t like the legal one. Plunging flower costs leave more room for retailers to pay the taxman while keeping retail pricing competitive. Overall, the industry is looking at “falling prices but increasing profits.”

But can soaring demand save grower margins too, even as wholesale prices crater? Trends in the adult-use pioneer states suggest there will be casualties as the market consolidates. The survivors will probably be of two types: those that apply big-ag methods to create low-cost mass production, and those who are able to build brand equity around reputations for quality. Many companies have done just that in wine, beer, coffee and other “mildly psychoactive products with a culture of connoisseurship,” as Arcview’s Troy Dayton once described cannabis to me. In this report and an upcoming Cannabis Intelligence Briefing we’re working on with Cannabis Benchmarks, we begin analyzing what that’s going to take in cannabis.



Tom Adams
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METHODOLOGY

The foundation of GreenEdge™ data is BDS Analytics' panel of participating dispensaries who contribute daily point-of-sales data. Dispensary panels are recruited to be both statistically significant as well as representative of the makeup of dispensaries in the market. Panel recruitment is ongoing and, whenever possible, new participating dispensaries provide historic sales data that is incorporated into the data of record. As the underlying sample increases over time, historic data also undergoes changes that could impact category mix, brand/product share, and average retail prices.

Cannabis Intelligence Briefing consumer spending forecasts are modeled based on BDS Analytics' GreenEdge data from markets including Arizona, California, Colorado, Washington and Oregon combined with publicly available data such as tax reports, patient counts and other information provided by regulatory authorities. This bottom-up approach of arriving at the global estimate for total legal spending is based on separate modelling analyses of 35 U.S. states expected to have medical or adult-use programs (or both) by 2022, 10 provinces and three Canadian territories, and 29 other countries. Estimated spending is derived from consumer-research-based estimates of legal consumers (patients in medical markets) and baseline per-consumer spending estimates adjusted for a variety of economic factors.

Cannabis Intelligence Briefing global cultivation demand forecasts are modeled based on GreenEdge data, consumer spending forecasts, cannabis products forecasts and wholesale pricing trends from Cannabis Benchmarks. Individual markets are modeled separately and adjusted for economic factors specific to each market.

LIST OF TERMS

Dried Cannabis Flower/Dried Flower – Throughout this report the terms "dried cannabis flower" or "dried flower" refer to what is being grown at the cultivation level.

Retail Flower/Flower – Throughout this report the terms "retail flower" or "flower" refer to the consumable product sold in the retail channel.

Cultivation Demand – Throughout this report the term "cultivation demand" defines the amount of dried cannabis flower that needs to be grown to satisfy consumer spending industrywide or in a particular market.

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Flower: The Foundation of the Cannabis Industry

The amount of dried cannabis flower that cultivators will need to grow to meet the worldwide demand for retail flower, concentrates, edibles and other cannabis-derived products will grow at a 26.5% CAGR, from 2.1 million pounds in 2017 to 6.9 million pounds in 2022. But given the 13.5 million pounds the state of California estimates it growers produced in 2016—legally and illicitly—that is clearly just the start of a long, legalization-driven growth curve.

Worldwide legal cannabis spending has experienced robust growth over the last few years, especially since adult-use sales began in 2014 in Colorado and Uruguay. Adult-use regulated cannabis sales propelled growth in an already substantial Colorado medical market and led total consumer sales in Colorado to reach \$1.5 billion in 2017, up from \$333 million in 2013. The Colorado market set the trend that has been replicated in all adult-use market launches that have followed.

Six US markets have begun adult-use cannabis sales—Alaska, California, Colorado, Nevada, Oregon and Washington. Cana-

da adult-use regulations are in place, and sales began on October 17, 2018. Maine, Massachusetts, Michigan and the District of Columbia have approved cannabis for adult use but sales are not yet underway.

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The next five years will see numerous US markets approve or begin adult-use sales. Greater still is the number of US and International medical markets that will come online. Total worldwide legal spending on cannabis is forecast to reach \$32 billion in 2022 up from \$9.5 billion in 2017, a compound annual growth rate (CAGR) of 27.5%. (For more details see “The State of Legal Marijuana Markets—6th Edition.”)

Spending in the US and Canada will make up an overwhelming majority of legal spending throughout the forecast period and beyond. Combined total spending in those markets reached \$9.1 billion in 2017 (96% of the worldwide total) and is forecast to grow to nearly \$29 billion in 2022 (90% of total). North American spending share will begin to decrease as large international markets like Germany are expected to experience significant growth.

With consumer spending on pace to grow substantially throughout—and well beyond—the forecast period, demand for dried cannabis flower will grow significantly as well. Cultivators must establish operations that can efficiently meet dried flower demand to be used in retail flower, concentrates, edibles and all other cannabis-derived products. With wholesale prices dropping and consumers’ preferences evolving, cultivators are being pushed to optimize growing

methods and broaden their operations beyond cultivation to fully capitalize on the booming industry.

Each of the three major ways to grow cannabis—indoor, outdoor and greenhouse growing—offer cultivators and investors unique benefits. Several factors feed into the decision on how to grow—weather, geography, regulatory environments, security and, most importantly, costs. Costs vary for all three types of cultivation based on the size of the operation, but typically will be lowest for outdoor grows.

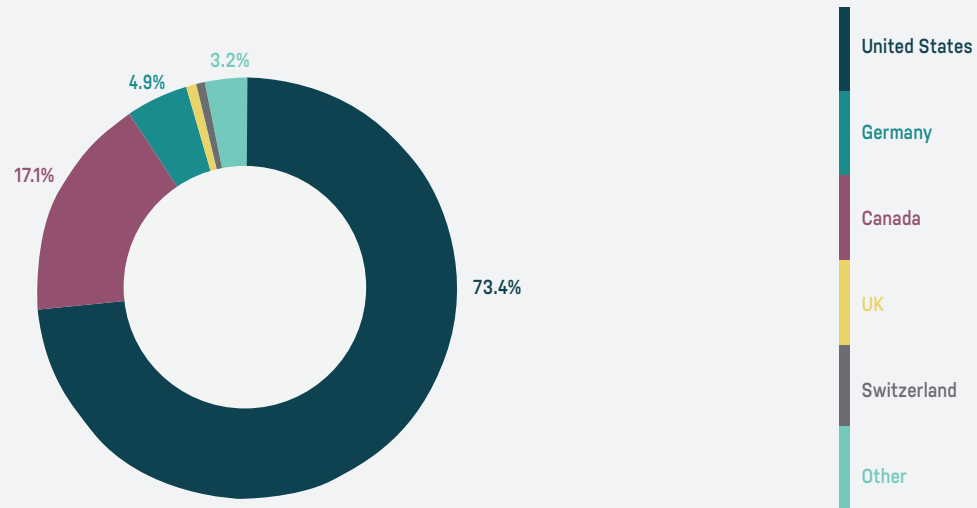
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2022 Worldwide Cultivation Demand



Source: Cannabis Intelligence Briefing

Like any other wild plant, cannabis thrives outdoors. Generally, plants have the room to grow larger and produce higher yields in outdoors. Outdoor cultivators may eventually have the unique opportunity to cite terroir and organically or sun-grown status to differentiate their product for consumers. But the most advantageous aspect is that outdoor growing will likely always be the cheapest way to grow cannabis in large volume.

Over the years prohibition and law enforcement actions drove the majority of growers indoors, and the technology involved in growing within four walls has greatly evolved. Enclosed growing—either in fully enclosed indoor facilities with only artificial light sources, or in mixed-light greenhouses—offers many advantages to growers in terms of automation, output uniformity, environmental control and product quality, but at considerably steeper costs.

Commercial grows are getting larger, and the cultivation technologies used in all three methods are evolving rapidly. Cultivators are steadily increasing productivity and quality, bringing consumers more choices and higher-quality cannabis products. Sustaining the growth and profitability of the cannabis industry hinges upon cultivators finding ways to continue this trend.

The 26.5% CAGR forecast for growth in dried flower demand slightly trails the 27.5% growth rate forecast in consumer spending through 2022. Concentrates and edibles continue to grow as a share of the legal cannabis market, and the need to produce cheap raw materials for those form-factors means cannabinoids will have to be ever more efficiently produced.

Though whole-plant extraction is becoming more popular for producing concentrates, much of the oil for edibles, topicals, and even for low-end concentrates will be extract-

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ed from the “trim” left over after raw flowers have been processed for sale. While using trim to keep costs low and profits high will be useful for processors, it of course does not add to the demand for dried flower from cultivators.

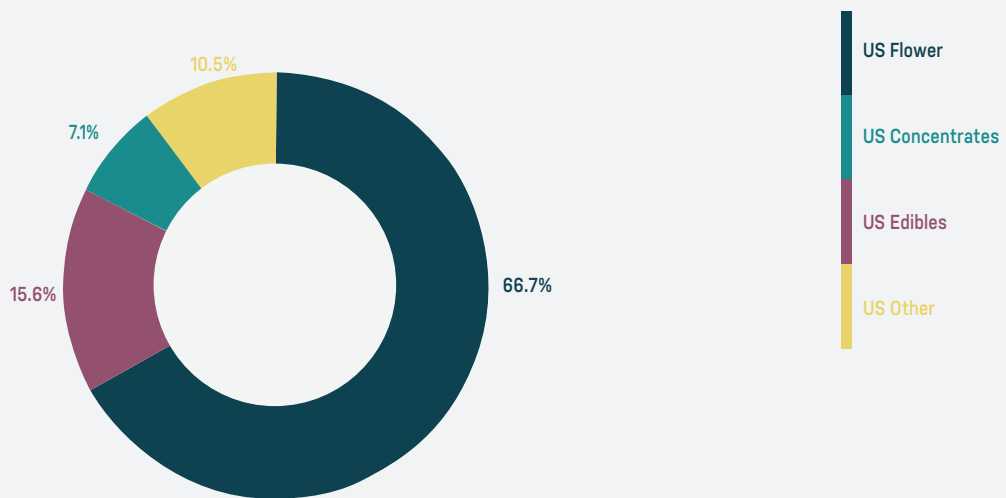
The US and Canada markets make up the vast majority of worldwide cultivation demand today—combined they equal 95% of the world’s total. Canada’s launch of adult-use legal sales combined with California and other US states moving to adult-use legal status, and new medical markets opening in the US, will keep North America atop the leader board in demand for dried cannabis flower for the foreseeable future. However global cultivation demand will receive a notable boost from international medical markets that are establishing new or broadening existing programs. Cultivation demand in

Germany’s medical market is forecast to reach 336,000 pounds in 2022—the fifth largest worldwide.

Flower has traditionally been the main cannabis consumable, especially in the US, and it dominated sales in the early legal marketplace. But as consumers ventured to try other consumable products, including concentrates and edibles, flower’s share of sales quickly decreased. The start of adult-use sales in US markets escalated the relative decline in flower consumption. Flower’s share of US consumer spending is estimated to drop to 36% in 2022, down from 50% in 2017.

Flower’s share of total cultivation demand, therefore, is dropping as well. In US markets, consumable flower made up 80% of cultivation demand in 2014 –the advent of adult-use sales. By 2017 that share had fallen to 68.6%.

2022 US Cultivation Demand By Product



Source: Cannabis Intelligence Briefing

In 2022 the share is forecast to reach 66.7%. Burgeoning international markets and emerging adult and medical markets in North America are expected to help temper the decline in flower cultivation demand, but the days of flower dominance are behind the cannabis industry.

Falling from the top has not stopped progress in the flower market segment, however. Cultivators are constantly looking for ways to differentiate and market consumable-flower product. Strain development has been one avenue that cultivators have used very successfully. Growers are able to customize user experience through hybridization and strain creation. Consumers have come to expect specific effects from different strains, allowing some strains to enjoy success throughout the entire industry.

Even though strains offer cultivators and consumers a way to differentiate flower product GreenEdge data reflects that even the most popular of strains are having a hard time gaining sizeable share. In all tracked markets generic strain blends make up the overwhelming majority of sales. In 2017 sales of blended strains accounted for more than 75.9% of all flower sales in Colorado. Similarly in Oregon blended strains made up 51.3% of sales in 2017. Despite the uphill climb there are some strains that manage to be top performers in several markets—Blue Dream being the most notable.

While cultivators have been working with specific strains for many years, creating and promoting brands in the cannabis industry has so far been the province of edibles, concentrates and topical makers. But that trend is shifting, with some major branding efforts now afoot in California and Canada as they go adult-legal. In the broader economy, branding allows companies to gain consumers' trust, offering the familiarity and the ability to replicate a particular experience. Once consumers find a brand they like they are more likely to seek out that brand when faced with the myriad of product choices.

In the nascent cannabis industry, concentrates, edibles and other products farther up the value chain lend themselves more easily to traditional branding, which may be one factor helping those categories outgrow consumable flower as the market expands.

Yet, even as flower's share of legal consumer spending shrinks, overall sales continue to grow rapidly (just not as rapidly as concentrates and edibles)

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But branding may yet come to the retail flower market: When California regulators began enforcing stricter packaging and labelling rules for retail flower, the branded share of flower sales jumped 27.5 percentage points to 41% of sales. While US federal prohibition stops brands from developing across markets, taking steps now to build a brand will go a long way toward securing market share once federal prohibition is lifted, allowing interstate commerce and eventually global trade.

The global legal cannabis industry is forging forward, with product evolution and consumer tastes progressing in parallel. Yet, even as flower's share of legal consumer spending shrinks, overall sales continue to grow rapidly (just not as rapidly as concentrates and edibles). In 2022 consumer spending on flower is forecast to reach \$8.5 billion with cultivation demand estimated at 3.4 million pounds—26.9% and 48.7% of the worldwide respective totals.

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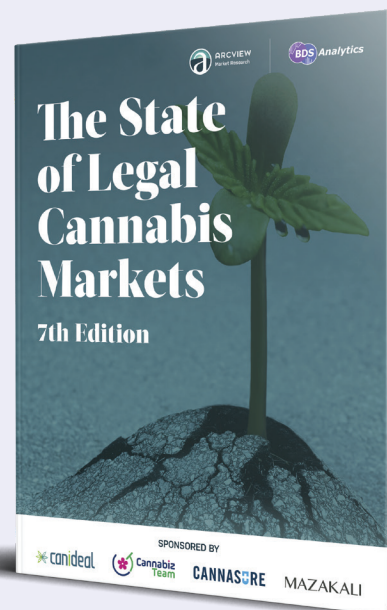
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