

Cannabis: The New Root and Stem of Higher Education

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Key Points

- Medical cannabis is legal in 33 states and Washington D.C., while recreational marijuana is legal in 11 states and Washington D.C.¹ In other words, cannabis in some form is now legal in two-thirds of the country. As of 2018, the U.S. cannabis industry was valued over \$10 billion and had created 243,000 new jobs.^{2, 3} Globally, the legal marijuana market is projected to grow to \$146.4 billion by the end of 2025.⁴
- Relative to other industries, the cannabis industry is new to the economy. As a result, it will create new jobs, new job titles, supply chains and products and services. There are currently four main job categories in the cannabis industry: cultivation, lab/extraction, manufacturing, and retail. The annual salary for top earners in each category is between \$80,450 (25th percentile) and \$139,274 (75th percentile). California and Colorado remain the two largest job markets in the U.S. cannabis industry, but Illinois and Florida are two of the largest growing markets.⁵
- According to Economic Modeling Specialists International (Emsi) and its 2020.3 dataset, the top six industries with the most cannabis job postings are agriculture, forestry, fishing and hunting; health care and social assistance; professional, scientific, and technical services; real estate and rental and leasing; retail trade; and manufacturing. The top three hard skills employers are looking for are auditing, packing and labeling, and key performance indicators (KPIs), while the top three soft skills employers are looking for are management, sales, and operations.
- Cannabis degrees have begun to emerge in the U.S. and are growing each year. California is home to three non-accredited cannabis trade schools, while two colleges in Ohio and Michigan launched the first four-year Bachelor of Science for cannabis programs.^{6,7} The University of Maryland offers the nation's only post graduate cannabis program.⁸ Other colleges and universities, such as Harvard, the University of Connecticut, Vermont and Vanderbilt, are also beginning to create cannabis courses as well.⁹ It is becoming more common for colleges to invest in cannabis coursework, and that trend is likely to continue in 2020. One company, Green Flower, is partnering with universities to provide industry-aligned cannabis certificate programs.¹⁰

¹ <https://www.businessinsider.com/legal-marijuana-states-2018-1>

² <https://www.thebalancecareers.com/legal-marijuana-industry-jobs-2059646>

³ <https://www.leafly.com/news/industry/243700-marijuana-jobs-how-many-in-america>

⁴ <https://www.grandviewresearch.com/press-release/global-legal-marijuana-market>

⁵ <https://info.vangst.com/vangst-2019-salary-guide>

⁶ <https://thebestschools.org/magazine/marijuana-degrees/>

⁷ <https://www.forbes.com/sites/joshmoody/2018/08/28/time-for-colleges-to-give-cannabis-a-try/#6ba380d56db1>

⁸ <https://www.leafly.com/news/industry/higher-education-university-cannabis-degree>

⁹ <https://www.usatoday.com/story/news/nation-now/2017/10/09/marijuana-degree-northern-michigan-university/745964001/>

¹⁰ <https://www.greenfloweredu.com>

Overview

A Growing Industry for Online Cannabis Certifications

The cannabis industry is booming. And weed isn't the only product in high demand. Educated workers are desperately needed to weigh in on the fast-paced evolution of cannabis in the U.S.. Such educational programs have been slowly sprouting up in the last 15 years. In early July, Mount Aloysius College launched a new online program that allows students to earn continuing education certificates in various cannabis-related fields. Founded by the Sisters of Mercy in 1853, Mount Aloysius is a small, Catholic college located 70 miles east of Pittsburgh. Students can choose from three non-credit cannabis certificates: Cannabis Healthcare and Medicine, Cannabis Law and Policy, and The Business of Cannabis. All three programs consist of three eight-week courses and can be completed entirely online.

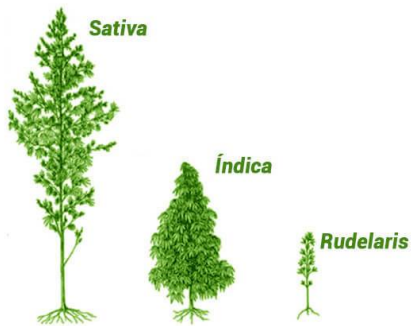
Why does Cannabis matter?

The “cannabis industry” refers to all business activities and professionals involved in the legal production, transportation, sale, or consumption of medical marijuana, recreational marijuana, hemp, and any other product derived from those three categories.¹¹ In simpler terms think of cannabis as a cash crop. Corn is one such example of a cash crop. It is sold in any way that people wish to consume the product: on the cob or off it, ground into grits, as an ingredient in vegetarian burgers, and so on. There are also derivative products from cash crops. For instance, sorbitol, a sugar found in corn, is used in many toothpastes. In the same vein, marijuana has a variety of product uses, and as interest in the crop continues to grow, people are finding more ways to use the crop in products. Cannabis can be smoked, eaten, used for medicinal or industrial purposes, etc. It has even found its way into pet foods. You yourself may use a cannabis product whether it is the plant itself or a product such as hemp lotion. But just like you may use toothpaste without realizing there is a corn derivative in it, there will be a host of products that will have cannabis ingredients that you will only become aware of if you read the nutrition or product label.

¹¹ <https://www.maximumyield.com/definition/5126/cannabis-industry>

What is Cannabis?

One of the challenges the cannabis market faces is difficulty in communicating the benefits and range of uses the plant has outside of recreationally smoking it. Many people conflate the terms “cannabis” and “marijuana.” Exploring the plant science of cannabis, from the family all the way down to plant varieties’ chemical compounds, clarifies various terminology (such as hash oil or hemp), shows where different cannabis product originate from in the plant genus, and make it easy to understand the varying legalization status of different plants.



Source: <https://cannabiscritic.home.blog/2018/11/13/cannabis-species-types/>

Like all other plants, there is a family, genus, and species classification. *Cannabaceae* is a family of flowering plants that contains the Cannabis genus. There are three species of Cannabis: *C sativa*, *C indica*, and *C ruderalis* (the least used of the three). Within the two primary species lie the marijuana and hemp varieties. Marijuana comes from the sativa and indica species and hemp only from the sativa species.¹² The major difference between marijuana and hemp is the amount of THC found with each specie. M is the term used to classify varieties of cannabis that contain more than 0.3% THC, while hemp is the term used to classify varieties of cannabis that contain 0.3% or less THC.¹³

Both of these species contain unique chemical compounds, and these compounds are the source of the medical, business, government, and recreational interest in cannabis plants. They are called “cannabinoids.”

The two most popular cannabinoids are tetrahydrocannabinol (THC) and cannabidiol (CBD). THC is the psychoactive part of cannabis plants that gets users “high,” and its effects are what most people think about when they hear someone say “cannabis.” The latter compound, CBD, is the non-psychoactive part of cannabis plants. Although it cannot get users high, it is still highly in demand due to its medicinal benefits.¹⁴

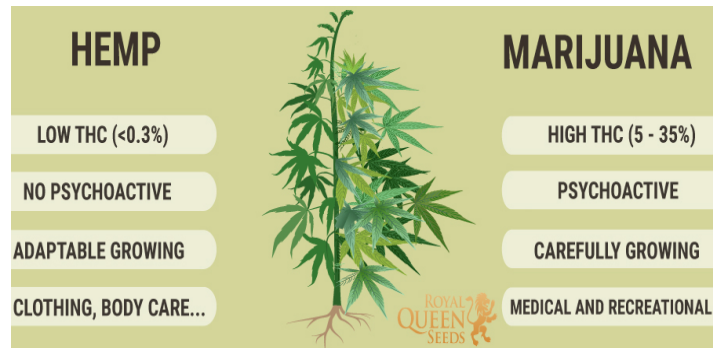
¹² <https://www.marijuanabreak.com/how-many-species-of-cannabis-are-there>

¹³ <https://medium.com/cbd-origin/hemp-vs-marijuana-the-difference-explained-a837c51aa8f7>

¹⁴ <https://www.royalqueenseeds.com/blog-the-marijuana-vs-hemp-debate-what-s-the-real-difference-n1111>

Hemp and marijuana plants contain both of these chemical compounds. However, relative to marijuana, hemp has a much higher CBD-content and has less than 0.3% THC-content. Although both hemp and marijuana belong to the sativa species of cannabis plants, hemp enjoys a superior legal status to marijuana. In December 2018, President Trump signed a farm bill into law that federally legalized growing and selling hemp. Therefore, all 50 states can now grow and sell hemp.¹⁵ It is mainly used to manufacture clothing, food and drink products, personal healthcare products, and rope, but it has also seen some medicinal use through CBD extraction. Hemp can impact you on a daily basis from the t-shirt you are wearing to the body lotion you are using to the bath bomb you are buying.

Marijuana, on the other hand, typically has 15 to 18% THC-content in the states in which it is legal, but it can be much higher. It is also used in recreational products such as “edibles” and hash oil (which can have THC levels over 90%) as well as medicinal products.^{16,17,18} American culture is steadily shifting away from the smoking-based conception of cannabis. Famously, former Speaker of the House John Boehner, who voted against medicinal marijuana legalization in 1999 and told a constituent in 2011 that he was “unilaterally opposed” to recreational marijuana, is now on the board of advisors for a cannabis company, Acreage Holdings. People are starting to see cannabis as an investment opportunity instead of a subculture or a black-market economy.¹⁹ The graph on the next page shows how estimated recreational cannabis demand compares to other common industries and goods. This estimate shows recreational cannabis near the top of the list, alongside beer and cigarettes.



Source: <https://www.royalqueenseeds.com/blog-the-marijuana-vs-hemp-debate-what-s-the-real-difference-n1111>

¹⁵ <https://www.vox.com/the-goods/2018/12/13/18139678/cbd-industry-hemp-legalization-farm-bill>

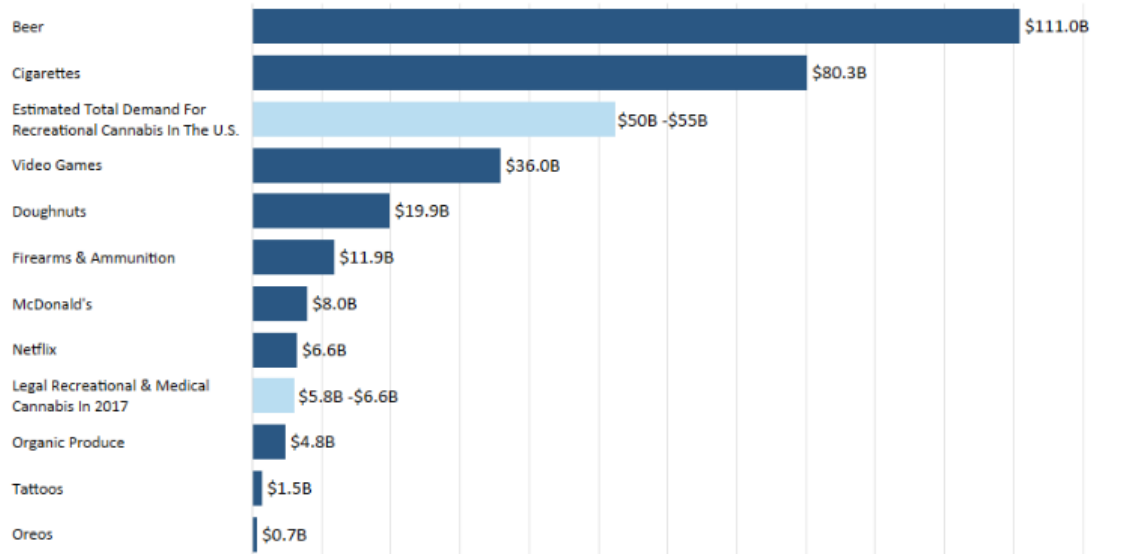
¹⁶ <https://medium.com/cbd-origin/hemp-vs-marijuana-the-difference-explained-a837c51aa8f7>

¹⁷ <https://www.businessinsider.com/what-is-hemp-different-from-weed-2018-3>

¹⁸ <https://www.cnbc.com/2014/02/26/dabsmarijuanas-explosive-secret.html>

¹⁹ <https://www.nytimes.com/2018/04/11/us/politics/boehner-cannabis-marijuana.html>

Annual U.S. Cannabis Sales Vs. Other Industries & Goods



Source: Brewers Association, Alcohol & Tobacco Tax & Trade Bureau, Entertainment Software Association, Goldstein Research, IBIS World, Netflix, Nielsen, Nabisco
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Highlights for the U.S. and global cannabis industry:

- There is a strong business justification for the cannabis industry. Hemp is federally legal in all 50 states, and over half of the US population now has access to recreational marijuana.²⁰
- More than 30 countries or territories around the world have legalized cannabis fully or partially for medical and/or recreational adult use.^{21, 22}
- Big Tobacco is granting credence to the growing cannabis market. Altria (formerly Philip Morris) invested \$1.8 billion in the Cronos Group, a Canadian-based cannabis company hoping to break into the newly legalized U.S. hemp market.²³
- The industry is becoming professionalized. One example is the cannabis job recruitment platform company “Graduajana,” which renamed itself as “Vangst” to attract more users and advertisers.²⁴ However, some of the cannabis word-play branding remains intact, such as company names like Leafly.
- Cannabis is stimulating the creation of science-based cannabis careers. This category includes “Master Extractors,” who typically hold PhD’s in biochemistry and run the labs that ensure the correct amount of THC and/or CBD are extracted from harvested

²⁰ <https://www.forbes.com/sites/julieweed/2018/12/15/predictions-for-cannabis-2019-from-entrepreneurs-on-the-front-lines/#8a8113c4a4cf>

²¹ <https://www.cannabisbusinesstimes.com/article/cannabis-legalization-world-map/>

²² <https://straininsider.com/cannabis-legislation-in-2018/>

²³ <https://www.fool.com/investing/2018/12/22/better-marijuana-stock-cronos-group-vs-medmen.aspx>

²⁴ <https://www.greenentrepreneur.com/article/331253>

cannabis plants.²⁵

- Another job category is horticulture-based. For example, there is demand for “Master Growers.” These are the horticulturists who are responsible for the healthy and consistent cultivation of cannabis. They oversee the plant nutrition, pest management, technology, etc., of cannabis farms.²⁶
- More generally, industrial engineers, food scientists and technologists, soil and plant scientists, biochemists and biophysicists, and chemists will be in high demand for this industry. (Employment data models are shown in the Occupational Analysis.)
- Distribution-based jobs include “budtenders,” who mirror their bartender counterparts, except they have a suite of cannabis products at their backs rather than alcohol.
- Traditional corporate jobs such as accounting, finance, legal, HR, IT, marketing, and more will also be created.²⁷
- The coronavirus pandemic has resulted in extended periods of isolation and stress for many individuals, with lifestyle disruption brought on by stay-at-home edicts and social distancing. COVID-19 has impacted the legal cannabis industry, both by increasing demand while complicating its supply chain. The net impact seems to be positive, as many players in the industry have seen an increase in their sales, particularly since cannabis was deemed essential in most legal markets. For instance, LeafLink has reported that over 50% of retailers purchased more after COVID-19 hit than they did during the first few weeks of the year.^{28, 29}

Given the domestic and global trend towards medicinal and/or recreational cannabis legalization and the multitude of businesses those laws will create, U.S. universities should consider preparing their students for emerging jobs in this growing market. The industry has expanded far beyond smoking cannabis products, since that is not what the future average use of cannabis will be. For the most part, universities have been taking a “wait and see approach” given the problem of the federal legality. However, seeing how far cannabis has come legally and culturally, it seems unlikely to be stopped now. Some universities will ignore cannabis and others will take advantage of the opportunity.

²⁵ <https://www.trade-schools.net/articles/cannabis-jobs.asp>

²⁶ <https://www.trade-schools.net/articles/cannabis-jobs.asp>

²⁷ <https://www.trade-schools.net/articles/cannabis-jobs.asp>

²⁸ <https://www.forbes.com/sites/irisdorbian/2020/08/17/despite-covid-19-2020-beats-2019-in-sales-will-be-positive-for-rest-of-year-says-new-report/#20b424836aeb>

²⁹ <https://www.chicagotribune.com/marijuana/sns-tft-coronavirus-increases-global-marijuana-demand-20200701-oygaxryb7vhcjfeu44cgacicaa-story.html>

Trends in Cannabis

Five of the most important cannabis trends are the continued existence of perplexing legal statuses, cannabis company and product developments, cannabis company financing and tax revenue uses, cannabis' new image on college campuses, and the effect of the black market on legal cannabis sales.

Cannabis legalization is constantly evolving

Current Status of Federal Law

The world is changing its mind about cannabis. From Europe to South America, countries are starting to legalize its different forms. The Appendix summarizes how global cannabis prohibition began and how legalization has crept up to the U.S.' northern and southern borders.

While nationwide legality is no longer a worry for the hemp industry, recreational and medicinal marijuana's legality is the source of the cannabis industry's greatest uncertainty and risk. Federally (the legal floor), marijuana remains illegal. However, in 2013, as a response to states such as Colorado legalizing recreational marijuana, Deputy Attorney General Jim Cole in the Obama administration wrote what became known as the "Cole Memo." This series of documents recognized that while medicinal and recreational marijuana use remained illegal under the Federal Controlled Substances Act, federal prosecutors should not focus on the substance so long as other federal priorities were not threatened by state legalization. However, Jeff Sessions, former Attorney General in the Trump Administration, rescinded the Cole Memo in 2018, which effectively ended the "hands-off," non-interference era of the federal government's policy towards marijuana.³⁰ Under the federal government's drug scheduling system, marijuana is a Schedule I drug, a category it shares with heroin and LSD. This designation means that marijuana is classified as a substance with little to no medical benefit.³¹ Nevertheless, legal cannabis in some form can still be accessed by 67% of the U.S. population; medicinal cannabis is legal in 33 states and D.C., while recreational cannabis is legal in 11 states (AK, WA, OR, CA, NV, CO, MI, VT, MA, ME, IL) and D.C.^{32, 33} Puerto Rico has also legalized medicinal cannabis.³⁴ Time will tell how the federal government chooses to regulate cannabis.

Upcoming State Legalization Efforts

With Election Day approaching, state lawmakers are crafting their bills and advocates are pushing to collect signatures to meet deadlines for getting their questions on the ballots. If these lawmakers were to succeed, many states could have cannabis laws that deviate from federal law by the end of the year. While unlikely this year, there is potential for nine states (NM, NJ, NY, CT, AZ, OK, MO, MT, SD) to vote on recreational marijuana legalization, and three states

³⁰ <https://www.cnn.com/2018/01/04/politics/jeff-sessions-cole-memo/index.html>

³¹ <https://www.vox.com/identities/2018/8/20/17938372/marijuana-legalization-federal-prohibition-drug-scheduling-system>

³² <https://www.forbes.com/sites/julieweed/2018/12/15/predictions-for-cannabis-2019-from-entrepreneurs-on-the-front-lines/#8a8113c4a4cf>

³³ <https://www.businessinsider.com/legal-marijuana-states-2018-1>

³⁴ <https://weedmaps.com/learn/laws-and-regulations/puerto-rico/>

(MS, ID, KS) to vote on medical marijuana legalization with New Mexico and New York the two most likely candidates for recreational marijuana legalization. In New Mexico, Gov. Michelle Lujan Grisham appointed a marijuana task force last year to create a detailed blueprint for enacting legalization. However, while the House passed an adult-use bill last year, it didn't pass the Senate. In New York, efforts failed in 2019 due to social justice issues holding up legislation. However, New York did pass legislation to expunge past cannabis convictions. In January, Gov. Andrew Cuomo said that cannabis legalization remains a priority for his administration and has convened regional governors to discuss potential legislation.

Mississippi is the most likely candidate to legalize medical marijuana legalization in 2020. In January, the secretary of state certified the campaign to put medical marijuana use on the ballot. This prompted the state Board of Health to pass a resolution opposing the initiative. However, a variety of conservatives back the campaign, and a group of doctors wrote to the Board of Health to express their support. Overall, advocates are optimistic about the proposal passing for medical marijuana in Mississippi.³⁵

All the different ways to use cannabis

Recreational products

Legalizing recreational cannabis has not changed the traditional consumption method of the product: smoking it. The most interesting development in smoking products has been the emergence of the craft brewery atmosphere. It seems to be a logical development, particularly when the name for the bartender's counterpart is called a "budtender," and there are other loose parallels. Instead of scrutinizing the ABV percentage, you scrutinize the THC percentage. Instead of nitrogenized beer, there are CBD-infused hybrid strains. Instead of choosing between a creamy stout or a citrusy IPA, you choose between an "energizing" sativa strain or a "mellowing" indica strain (or a hybridized combination of the two strains).³⁶

This analogy has not been lost on brewing companies either. Many of these firms are seeking to diversify their exclusively alcoholic beverage revenue streams. Legal North American marijuana began in the Rocky Mountains. Molson Coors is now partnering with Canadian cannabis company Hydropothecary Corporation to create non-alcoholic, cannabis infused beverages to be sold in Canada this October. The creator of Blue Moon, Keith Villa, and his wife Jodi Villa are partnering with cannabis extraction lab Ebbu to create a new firm: Ceria Beverages. It will create THC-infused beverages with the same "onset time as alcohol." Outside of the realm of THC, firms such as New Belgium Brewing have started to create hemp-based drinks known as "Hemp Pale Ales" (HPA's).³⁷ Besides diversification and growth concerns, there are other connections between alcohol and cannabis such as science and culture. Cannabis and hops both belong to

³⁵ <https://www.politico.com/news/2020/01/20/marijuana-legalization-federal-laws-100688>

³⁶ <https://www.rollingstone.com/culture/culture-lists/american-pot-5-best-strains-of-2017-199870/gsc-a-k-a-platinum-cookies-f-k-a-girl-scout-cookies-199919/>

³⁷ <https://www.westword.com/marijuana/five-beer-companies-and-brewers-entering-the-legal-cannabis-trade-10666109>

the same Cannabaceae plant family and both alcohol and marijuana are seen as connected since they are emblematic of American counterculture.³⁸

Another important product category is “edibles.” Edibles are food products infused with THC and/or CBD, and since either chemical can virtually be put in all foods, edibles can basically be anything. Cookies and brownies may be the most commonly thought of edibles. However, they are not the market’s first choice, as gummies are the most popular edible in the United States. In California, gummies claim 27% of the market, followed by baked goods (10%) and chocolate bars (7%). The most popular edible flavors are the kinds of fruits incorporated into pies, drinks, and ice cream. These flavors include watermelon, blackberry, and blue raspberry.³⁹ Even pets have joined the market. Some dispensaries in Colorado offer hemp and CBD products specifically designed for household pets.⁴⁰

But ingesting cannabis is not the only reason why it is sold. Continuing the previous beer analogy, a criticism of the nascent cannabis industry is that it is overly marketed to men and ignores women. One way the industry is trying to correct this problem is the introduction of cannabis beauty and skin care products. Research is still lackluster, but the products are said to help fight acne and to have anti-inflammatory properties.

Medicinal products

Historically, people think of traditional, THC-based cannabis products when they think of medical marijuana. However, this view is changing for two legal reasons. First, because of marijuana’s Schedule I classification, the amount of medical research that can be conducted is severely limited, which has had a limiting effect on its usage.⁴¹ Second, the previously mentioned 2018 Farm Bill means that hemp-derived CBD is legal in all 50 states.⁴² The U.S. Food and Drug Administration (FDA) also recently received a unanimous vote from its federal advisory committee to recommend approval of a pharmaceutical CBD oil called Epidiolex. Studies have found CBD oil to be useful for treating pain, cancer, anxiety, depression, and sleep issues.⁴³ The four primary methods of taking CBD oil are ingestion, sublingual, topical, and inhalation.⁴⁴

Branding and market leadership

With Canada only having legalized recreational marijuana last year, it is too soon for market leaders to emerge. In the United States, California, Colorado, and Oregon (the states with the most developed cannabis markets) have seen firms come and go in their top ten brand lists.⁴⁵

³⁸ <https://www.nytimes.com/2018/11/15/dining/drinks/beer-cbd-marijuana-breweries.html>

³⁹ <https://bdsanalytics.com/what-was-hot-in-pot-in-2018-cannabis-product-trends/>

⁴⁰ <https://www.thestreet.com/lifestyle/health/5-cannabis-products-on-rise-14578907>

⁴¹ <https://www.rollingstone.com/culture/culture-lists/american-pot-5-best-strains-of-2017-199870/gsc-a-k-a-platinum-cookies-f-k-a-girl-scout-cookies-199919/>

⁴² <https://medium.com/cbd-origin/is-cbd-legal-legal-status-of-cbd-2018-d1b4a0ed42df>

⁴³ <https://www.thestreet.com/lifestyle/health/5-cannabis-products-on-rise-14578907>

⁴⁴ <https://echoconnection.org/how-take-cbd-oil-options/>

⁴⁵ <https://bdsanalytics.com/what-was-hot-in-pot-in-2018-cannabis-product-trends/>

Firms have not been shy about their attempts to make their brand synonymous with cannabis itself. In what led to an interesting financial story, the Potash Corp. gave up its POT stock ticker and demand for these three letters was so high that Canadian exchanges held a lottery to see which company would get the ticker. Other noteworthy stock ticker branding includes the Canopy Growth Corp.'s WEED ticker, and ETFMG Alternative Harvest's MJ ticker (Mary Jane).

How cannabis companies raise money and how governments use cannabis taxes

Financing within cannabis companies

In terms of private funding, cannabis companies are following the typical trajectory of any firm, using seed capital and Series A rounds.⁴⁶ Recently, Silicon Valley entered the market in a “Shark Tank” style entrepreneur pitch, where the winner received a \$10,000 investment.⁴⁷ There was also a popular instance where Peter Thiel invested \$75 million in a cannabis company. On the private lending side, it can be difficult for cannabis companies to get loans. Banks are weary lending and CPAs are loath to audit these firms due to federal regulation, making it difficult for cannabis companies to prove their financial health. Where things get more interesting is in terms of public funding. There have been many interesting stock exchange developments for cannabis companies in North America. Canada's legalization of recreational cannabis is recognized as the biggest trend of 2018 for the industry.⁴⁸ It allowed companies like the Cronos Group and Tilray to list on the NASDAQ and reach market caps of \$1.3 billion and \$1 billion, respectively. However, another trend with a potentially stronger effect on the market is the fact that Canada's recreational cannabis legalization causes the stock exchange listing to cut both ways between the United States and Canada. U.S. cannabis companies, denied access to U.S. exchanges due to federal law, have begun listing on the Canadian Securities Exchange (CSE). Two such companies are MedMen and Green Thumb Industries. MedMen is on the smaller size with a market capitalization of around \$60 million⁴⁹, while Green Thumb Industries has a market capitalization over \$2 billion.⁵⁰

Tax revenue and usage

Colorado, the poster-child of cannabis in the United States, trailblazed the industry's taxation. The western state has three primary cannabis taxes: a 2.9% sales tax, a 10-15% special sales tax on retail marijuana, and a 15% excise tax on retail marijuana. The combined effect of these taxes yielded a revenue of \$211M for the state. Highlights of this tax revenue usage include \$30M for state public school funding and \$32M for substance abuse, youth prevention, and mental health services.⁵¹ Some, such as NYU Professor Mitchell Moss, believe that legalizing and taxing marijuana could be the future of infrastructure funding such as mass transit.⁵² For example,

⁴⁶ <https://www.greenentrepreneur.com/article/312309>

⁴⁷ <https://www.theatlantic.com/business/archive/2018/04/a-silicon-valley-pot-deal/558281/>

⁴⁸ <https://www.forbes.com/sites/julieweed/2018/12/15/predictions-for-cannabis-2019-from-entrepreneurs-on-the-front-lines/#373a4ca94a4c>

⁴⁹ <https://finance.yahoo.com/quote/mmfff?ltr=1>

⁵⁰ <https://finance.yahoo.com/quote/gtbif?ltr=1>

⁵¹ <https://www.westword.com/news/heres-where-your-colorado-marijuana-tax-dollars-go-10214271>

⁵² <https://newyork.cbslocal.com/2018/12/06/marijuana-tax-nyc-subway-system-mta-mitchell-moss/>

many New York state senators are calling for recreational cannabis legalization so the taxes can fund much-needed subway repairs.⁵³

Cannabis rebrands itself at universities

Cannabis research programs have been stymied due to its Schedule I status. For example, the University of Washington and Washington State issued research guidance prohibiting marijuana research despite the state’s legalization. Recreational marijuana’s uncertain legal environment has hindered its ability to become ingrained in higher education. Nonetheless, some schools have begun to embrace cannabis, especially in business programs. Central Washington University’s business school hosted a “Cannabis Caucus” last year. Additionally, Evergreen State College offers a course called “The Business of Cannabis,” where students learn a variety of topics ranging from the social history of cannabis to tax implications outlined for the cannabis industry.⁵⁴ Plus, affluent investors are beginning to get involved in the cannabis market. One of the prominent investors in the cannabis education company Green Flower, Bob Broderick, made a \$9 million donation to Harvard and MIT for cannabis research. It was the largest private donation ever made in higher education for cannabis research.⁵⁵ Cannabis degrees have begun to emerge as well. These degrees are supported in two ways: trade schools and traditional four-year institutions. First, trade schools are trailblazing cannabis degrees. California has three: Oaksterdam University, Cannabis College, and Humboldt Cannabis College.⁵⁶ Oaksterdam’s horticulture program which teaches students how to cultivate and manage cannabis plants is an example of these trade schools’ offerings.⁵⁷ Many of these schools are not accredited, but accredited cannabis trade programs do exist. Hocking College, a small vocational school in Ohio, created what is believed to be the first cannabis laboratory technician major.⁵⁸ Northern Michigan University and Minot State University offer four-year Bachelor of Science programs for Medicinal Plant Chemistry, or cannabis. The programs combine chemistry, biology, botany, horticulture, marketing, and finance, showcasing the interdisciplinary skills required in the industry. The University of Maryland offers the nation’s only Master of Science in Medical Cannabis Science and Therapeutics. This program requires no background in science and prepares students for clinical, scientific, and policy roles within the industry.⁵⁹ Harvard, the University of Denver, Vanderbilt, and Ohio State University all offer classes on marijuana policy, law, business, and journalism.⁶⁰ Aside from cannabis-focused programs or a cannabis degree, a degree in business administration is commonly used to break into the industry. Other common degrees used in the cannabis industry are biology, healthcare, and marketing.

⁵³ <https://www.nytimes.com/2018/12/05/nyregion/marijuana-legalized-nyc-subway.html>

⁵⁴ <https://www.greenentrepreneur.com/article/322215>

⁵⁵ <https://www.wbur.org/commonhealth/2019/04/30/broderick-cannabis-science-harvard-mit>

⁵⁶ <https://thebestschools.org/magazine/marijuana-degrees/>

⁵⁷ <https://oaksterdamuniversity.com/academics/>

⁵⁸ <https://www.forbes.com/sites/joshmoody/2018/08/28/time-for-colleges-to-give-cannabis-a-try/#6ba380d56db1>

⁵⁹ <https://www.leafly.com/news/industry/higher-education-university-cannabis-degree>

⁶⁰ <https://www.usatoday.com/story/news/nation-now/2017/10/09/marijuana-degree-northern-michigan-university/745964001/>

Leaders in universities are starting to recognize the growth of the cannabis industry: “I don’t think there is any doubt.... the pendulum swings in anything, and so it’s been sort of a hot growth area, and as it matures, just like any field where it matures, there’s going to be a flight quality. So, quality knowledge will be at a premium as the field continues to (grow).”

- Assistant Vice Provost, Public University

The black market still controls the industry

Despite the legalization of recreational marijuana in 11 states and D.C., the black market still makes up most of the revenue from cannabis sales. Brendan Kennedy, CEO of Tilray, the first marijuana firm to go public on Nasdaq, believes that the illegal cannabis market is worth about \$50 billion a year in the U.S. and \$200 billion world-wide.⁶¹ This problem is especially prominent in California, where it is estimated that illegal sellers currently outnumber legal and regulated businesses almost 3-to-1.⁶² According to New Frontier Data, as much as 80% of cannabis sales in California stem from the black market. The research company estimates that the illegal cannabis market is worth \$3.7 billion, more than four times the size of the legal market in the state. The problem has become such an issue that Governor Gavin Newsom, an outspoken advocate for legal cannabis, proposed moving 150 National Guard troops to Northern California to help deal with illegal cannabis growers. In Canada, the black market accounted for around 71% of cannabis sales in 2019. In Washington State, police have their hands full trying to arrest illegal cannabis farm workers. In Massachusetts, an estimated 75% of cannabis sales will occur on the black market. Illegal cannabis dealers are crippling the profitability of the market, and change needs to occur for the industry to thrive.⁶³ A large part of the problem stems from the fact that marijuana is still illegal in a large part of the country. Underfunded law enforcement officers are struggling to contain the large existing criminal network that has been in place for years. Pair that with slow-moving regulators who are unable to build a legal regimen fast enough, the black market is going to continue to be an issue. While advocates believe that states can do more to fight against the black market, it will remain a losing battle until the federal government changes its Schedule I classification of cannabis. Once cannabis is treated in the same manner as alcohol, only then will the industry be able to shed its parasitic black market.⁶⁴

⁶¹ <https://www.wsj.com/articles/a-ceo-tries-to-navigate-the-legal-cannabis-sectors-bad-trip-11583518019>

⁶² <https://www.nbcnews.com/news/us-news/california-s-cannabis-black-market-has-eclipsed-its-legal-one-n1053856>

⁶³ <https://www.forbes.com/sites/kevinmurphy/2019/04/04/cannabis-black-market-problem/#6dbb960c134f>

⁶⁴ <https://www.politico.com/magazine/story/2019/07/21/legal-marijuana-black-market-227414>

Occupational Analysis

Current available jobs related to cannabis

Occupational and job analysis in this research is focused on two areas: the U.S. and 10 cannabis companies used as an example. While this research is not exhaustive, its purpose is to provide a sense of the current need for professionals in the industry.

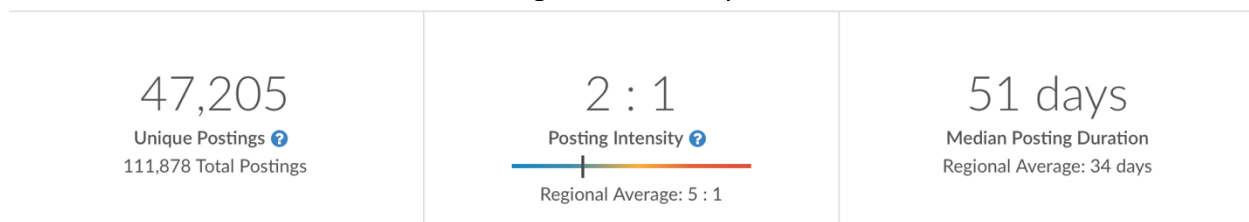
This report shows occupational and demographic information for cannabis-related jobs on a national level. It also includes the employment outlook for emerging jobs that will require cannabis knowledge. All figures and tables are taken directly from Economic Modeling Specialists International (Emsi) and its 2020.3 datasets.

Region: The United States

Currently emerging jobs related to cannabis

Figure 1 highlights the number of job postings across all occupations in 2019 in the U.S. that include the word “cannabis.” Out of 111,878 job postings, 47,205 were unique, resulting in a posting intensity of 2:1, half the national average. This suggests that firms may not be trying as hard to fill these positions.

Figure 1: U.S. Job Postings that Contain “Cannabis” Across All Occupations for August 2019 – July 2020



Numerous reports and job posting sites were consulted to determine new jobs already or soon to be created by the cannabis industry. The following job titles were listed: field grower, general manager cannabis grow (manufacturing and production), master grower, digital marketing director, merchandise planner, and director of operations and client onboarding.^{65,66} It is worth noting that there are many job listing platforms dedicated to cannabis, such as the previously mentioned company Vangst and Cannabiz.

⁶⁵ <https://vangst.com/cannabis-jobseeker>

⁶⁶ <https://www.indeed.com/q-Cannabis-jobs.html>

Salary expectations

Ancillary jobs such as construction, store workers, and corporate functions such as IT should expect compensation in line with other industries that employ those jobs. Cannabis-specific jobs on the other hand, have a wide variance in salaries. The four main job categories in the cannabis industry are cultivation, lab/extraction, manufacturing, and retail.

In cultivation, the top earners are directors of cultivation, with salaries between \$59,800 (25th percentile) and \$118,600 (75th percentile). Other jobs in cultivation are grow managers, horticulturists, and trimmers/post-harvesters. Trimmers earn the lowest income, averaging around \$13.90 per hour.

In lab/extraction, the top earners are directors of extraction, with salaries between \$75,000 and \$119,500. Other jobs in this category are extraction managers, quality managers, compliance managers, and chemists. Chemists have the lowest income, averaging around \$63,200 but they earn significantly more than the lowest income employees of the other three categories.

In manufacturing, the top earners are VPs of manufacturing, with salaries between \$107,000 and \$167,000. Other jobs in this category include production supervisors, edibles specialists, production technicians, and packagers. Packagers have the lowest income, averaging around \$14.80 per hour.

In retail, the top earners are VPs of retail, with salaries between \$80,000 and \$152,000. Other jobs in this category include directors of retail, merchandise planners, general managers, and budtenders. Budtenders earn the least, averaging around \$14.90 per hour.⁶⁷

⁶⁷ <https://info.vangst.com/vangst-2019-salary-guide>

Education and skill requirements

The industry spans from science-based to business-based careers, and the skills required for each cannabis job vary greatly. Typical in-demand skills include prior cannabis knowledge, reading and writing comprehension (specifically legal comprehension in the case of cannabis), basic computer skills (from Microsoft products like Excel and Azure to POS systems), and general soft skills (communication, workplace passion, etc.).⁶⁸ Careers beyond budtender or extractor assistant will require a bachelor's degree, such as in business, engineering, biology, chemistry, agriculture, and horticulture. Typically, scientific careers (e.g., Master Growers or Master Extractors) will require a master's degree, PhD, or other advanced degree. Similar to education requirements, work experience is also variable. Some workers have come in with no direct experience, while other positions require years of experience.⁶⁹ Established occupations will also need further education as cannabis legalization continues as well. For example, law and policy, criminal justice, and the health industry will all intersect with cannabis. Health professionals will especially need more education to ensure they fully understand all the medical benefits. Currently, a low percentage of physicians receive training on medical marijuana. In a 2017 study, it was found that almost 85% of physicians reported receiving no education about medical marijuana during medical school or residency.⁷⁰

“There are many, many medical benefits to using cannabis because it has a similar molecule structure to the endocannabinoids. So, doctors need to understand this, all medical professionals need to understand this, nurses, medical assistants, pharmacists, and all those people so that they can properly work with the patient and understand how to properly prescribe and dose with a patient using cannabis.”

- Joe Barnard, Head of Curriculum and Accreditation, Green Flower

⁶⁸ <https://www.cannabisbusinesstimes.com/article/job-skills-hiring-cannabis-companies/>

⁶⁹ <https://www.forbes.com/sites/heathercabot/2018/02/13/do-you-need-a-degree-to-work-in-marijuana/#4b7f61577511>

⁷⁰ <https://www.statnews.com/2018/04/24/medical-school-teaching-pain-medical-marijuana/>

Employment outlook

There are firms that specialize in hemp production, recreational marijuana production, medical marijuana production, or a combination of those three. The two countries with the highest demand for workers are Canada and the United States, both with a need for traditional corporate jobs in addition to cannabis professionals.

Due to cannabis' murky legalization status, the Bureau of Labor Statistics has abstained from making projections. Firms such as BDS Analytics and Arcview have filled the void, estimating that there could be as many as 630,000 cannabis jobs by 2025.⁷¹ According to Leafly's fourth annual cannabis jobs count, there are 243,700 cannabis jobs as of 2020. The cannabis industry is the greatest job-creation engine, growing at a faster rate than any other industry for the last four years. Last year, the number of cannabis jobs in America grew by 15%. From 2018-2028, legal cannabis jobs are expected to grow by 250%. The job with the next highest growth over that span is solar photovoltaic installers at 63%.⁷²

Due to expansion of the cannabis industry, another important effect it has had on the job market is the creation of indirect jobs. In 2019 it was estimated that 85,000 indirect jobs were created.⁷³ These include occupations such as nursing, therapy, healthcare, software, hardware, packaging, legal, marketing, consulting, and many more.

While the cannabis industry is growing at a rapid rate, the industry did experience a slowing of job growth in 2019 in part due to a slow growing Canadian market, a national vaping health crisis and layoffs at some leading brands.⁷⁴ However, the industry is expected to rebound in 2020 and will be aided by newly legalized states. Illinois just recently became the 11th state to legalize recreational cannabis, and jobs are expected to grow exponentially within its market. In 2019, the state's medical marijuana industry employed nearly 5,800 people. However, due to its recent legalization, a new report shows that Illinois' legal cannabis industry will employ over 63,000 people by 2025. For comparison, if that were to occur, there would be the same number of cannabis workers as there are elementary school teachers in the state.⁷⁵

Experts in the cannabis field believe job growth is just taking off: "I still don't think we've pushed the envelope. I didn't even talk about the textile component of industrial hemp. The disruption it will cause in plastics, in fuel, in clothing, in buildings and all these different areas that aren't even spoken about. I think it's just going to hit society by storm. We see it, but it isn't an obviously known thing yet. So, there will be a lot of jobs in that area."

- Joe Barnard, Head of Curriculum and Accreditation, Green Flower

⁷¹ <https://azmarijuana.com/marijuana-news/u-s-marijuana-industry-jobs-estimated-to-triple-by-2025/>

⁷² <https://www.leafly.com/news/industry/243700-marijuana-jobs-how-many-in-america>

⁷³ <https://leafly-cms-production.imgix.net/wp-content/uploads/2019/03/01141121/CANNABIS-JOBS-REPORT-FINAL-2.27.191.pdf>

⁷⁴ <https://d3atagtOrnqk7k.cloudfront.net/wp-content/uploads/2020/02/06145710/Leafly-2020-Jobs-Report.pdf>

⁷⁵ <https://chicago.suntimes.com/2019/10/7/20903738/pot-jobs-illinois-marijuana-recreational-legalization-employment>

Job posting analytics of cannabis companies

To analyze the job trends within the industry, this report examines 10 different companies: Med Men LLC, Green Thumb Industries, Cresco Lab LLC, Kushco Holdings LLC, Curaleaf, Halo Labs LLC, GrowGeneration, Liberty Health Sciences, Charlotte’s Web, and Acreage Holdings. While this list is not exhaustive, it gives an overview of the current status of cannabis-related jobs nationwide.

Figure 2 shows the job posting intensity for the industry from August 2019 to July 2020. There were 10,063 total postings, of which 3,173 were unique, a posting intensity of 3:1. This means that for every three jobs posted, one was unique, suggesting that the cannabis industry is putting in half as much effort into job hiring as the national average.

Figure 2: Job Postings Overview for Cannabis Companies for August 2019 – July 2020

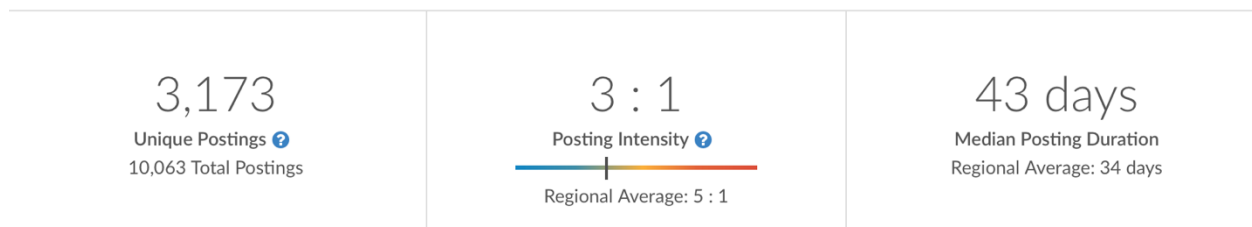


Figure 3 details the geographic breakdown of the cannabis industry’s job postings by state. Illinois had the highest (802), followed by Florida (638) and California (291). Illinois just recently legalized recreational marijuana, which is contributing to a spike in jobs. Florida has one of the fastest-growing cannabis markets in the country. It should be noted that both California and Colorado remain the two largest job markets for the cannabis industry. This data represents 10 of the bigger cannabis companies in the U.S. and is more indicative of rising trends.

Figure 3: Regional Breakdown of Job Postings for Cannabis Companies

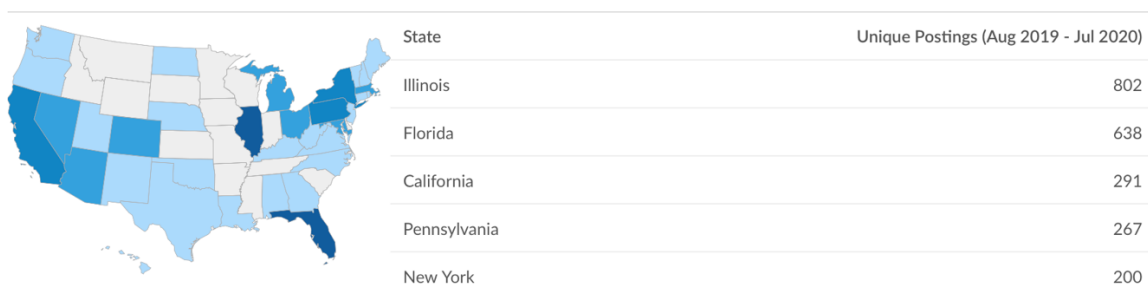


Figure 4 lists the cities with the most job postings for the cannabis industry. The city with the highest concentration is Chicago, followed by Phoenix, New York and Las Vegas.

Figure 4: Top Posted Cities for Cannabis Companies for August 2019 – July 2020











City	Total/Unique (Aug 2019 - Jul 2020)	Posting Intensity	Median Posting Duration
Chicago, IL	1,782 / 469	4 : 1 	50 days
Phoenix, AZ	219 / 74	3 : 1 	39 days
New York, NY	314 / 71	4 : 1 	54 days
Las Vegas, NV	234 / 70	3 : 1 	37 days
Los Angeles, CA	226 / 69	3 : 1 	31 days
Joliet, IL	151 / 66	2 : 1 	25 days
Brookville, PA	226 / 65	3 : 1 	61 days
Lincoln, IL	203 / 50	4 : 1 	77 days
Danville, PA	120 / 49	2 : 1 	60 days
Mount Dora, FL	127 / 45	3 : 1 	25 days

Figure 5 exhibits the cannabis industry’s top posted occupations. The three with the highest number of unique job postings were customer service representatives (227), general and operations managers (197), and first-line supervisors of production and operating workers (118).

Figure 5: Top Posted Occupations for Cannabis Companies for August 2019 – July 2020





















Occupation (SOC)	Total/Unique (Aug 2019 - Jul 2020)	Posting Intensity	Median Posting Duration
 Customer Service Representatives	855 / 227	4 : 1 	49 days
 General and Operations Managers	572 / 197	3 : 1 	36 days
 First-Line Supervisors of Production and Operating Workers	271 / 118	2 : 1 	34 days
 Accountants and Auditors	400 / 91	4 : 1 	47 days
 First-Line Supervisors of Retail Sales Workers	226 / 86	3 : 1 	32 days
 Industrial Engineers	254 / 84	3 : 1 	70 days
 Human Resources Managers	272 / 83	3 : 1 	46 days
 First-Line Supervisors of Office and Administrative Support Workers	185 / 77	2 : 1 	32 days
 Pharmacy Aides	224 / 68	3 : 1 	52 days
 Stockers and Order Fillers	154 / 64	2 : 1 	38 days

Figure 6 displays the cannabis industry’s most frequently posted job titles. The two jobs with the highest number of unique postings were patient care coordinators (105) and customer services associates (office and administrative support) (95).

Figure 6: Top Posted Job Titles for Cannabis Companies for August 2019 – July 2020

Job Title	Total/Unique (Aug 2019 - Jul 2020)	Posting Intensity	Median Posting Duration
Patient Care Coordinators	467 / 105	4 : 1	55 days
Customer Service Associates (Office and Administrative Support)	341 / 95	4 : 1	52 days
Patient Liaisons	460 / 63	7 : 1	38 days
Delivery Drivers	119 / 61	2 : 1	32 days
Marketing Managers (Management)	214 / 60	4 : 1	57 days
Retail Sales Associates	154 / 58	3 : 1	29 days
Restaurant Managers (Food Preparation and Serving Related)	149 / 54	3 : 1	55 days
Customer Service Representatives (Office and Administrative Support)	127 / 48	3 : 1	59 days
Laboratory Technicians (Life, Physical, and Social Science)	96 / 44	2 : 1	39 days
Pharmacists	193 / 41	5 : 1	39 days

Figure 7 shows the most frequently posted hard skills desired by the cannabis industry compared to the most frequently listed hard skills in workplace profiles. Some of the top hard skills are packing and labelling, auditing, and standard operation procedure.

Figure 7: Top Posted Hard Skills for Cannabis Companies

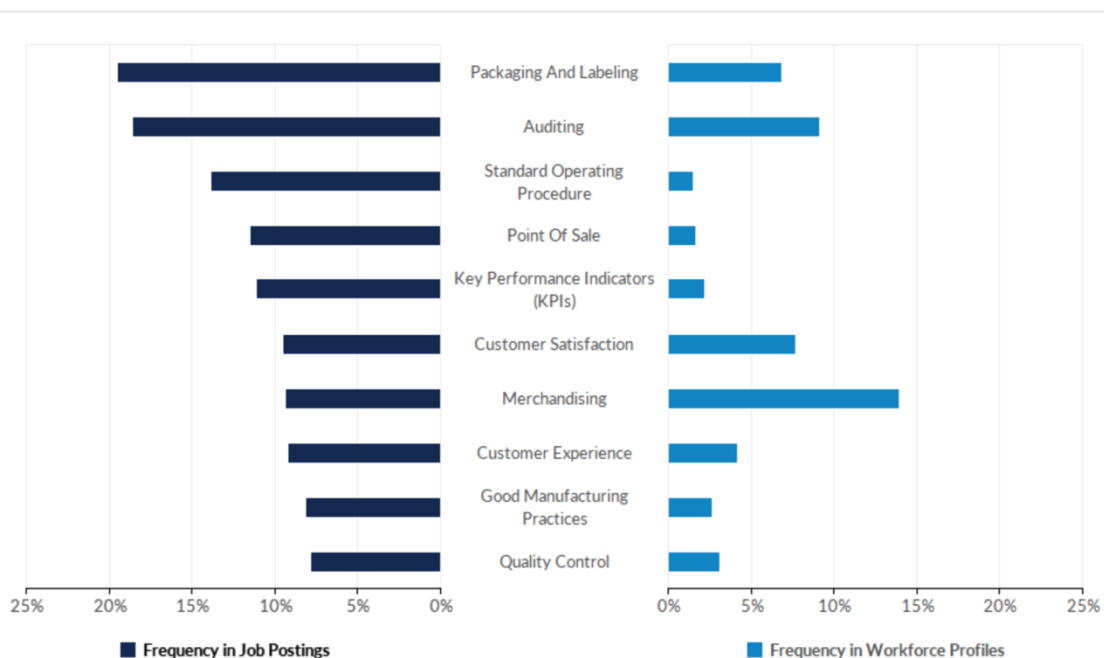


Figure 8 shows the most frequently posted common skills desired by the cannabis industry compared to those in workplace profiles. All of the common skills appear in both the job postings and workforce profiles.

Figure 8: Top Posted Common Skills for Cannabis Companies

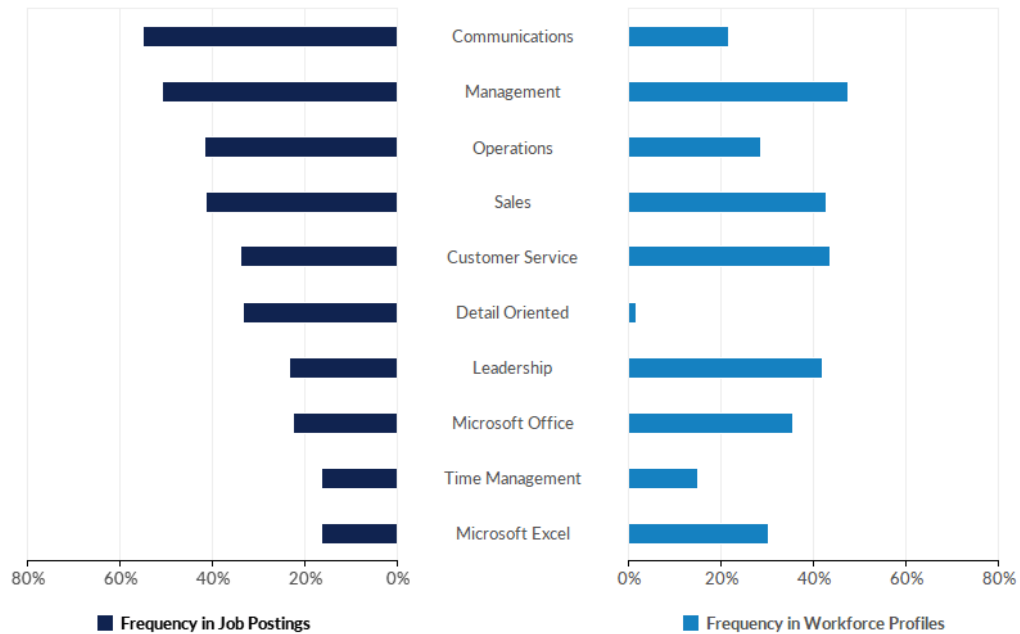
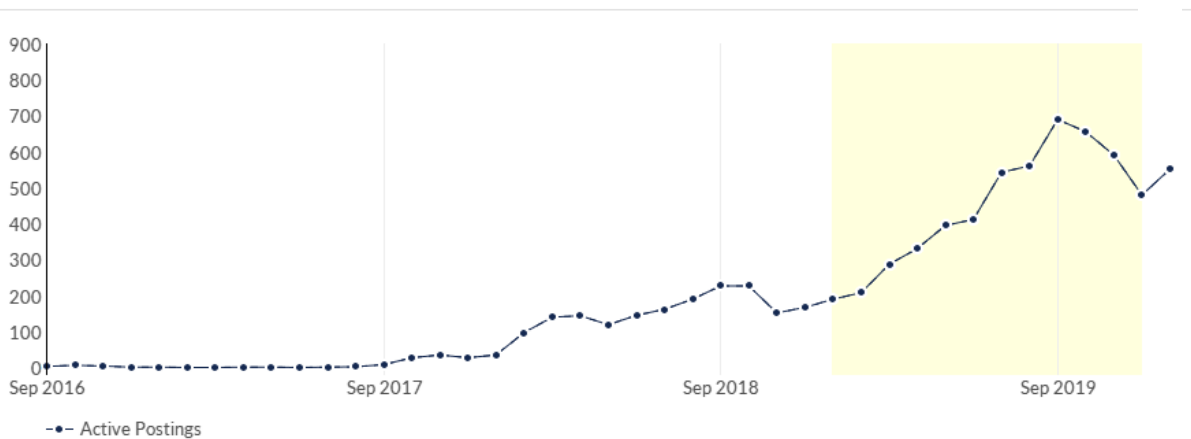


Figure 9 charts the cannabis industry’s monthly active postings. From September 2016 to September 2017, active postings never exceeded 8 postings per month, a ratio of 1:1. From October 2017 to January 2020, postings rose from 27 per month to a high of 690 in 2019 with 552 in January of this year.

Figure 9: Monthly Active Postings for Cannabis Companies



Investment by Fortune 500 Companies

Everyone is currently looking for the next big thing, investing in AI, self-driving cars, or 5G. Some consumer brand companies are starting to take notice of the cannabis industry and the potential benefits of investing in it. As cannabis is legalized in more parts of the country, this trend should continue until the industry becomes more established in the American economy. Currently, two Fortune 500 companies have jumped on board the cannabis band wagon through multi-billion-dollar investments.

Constellation Brands, which includes brands such as Corona and Modelo in its portfolio, was the first Fortune 500 company entering the market by investing heavily in Canopy Growth Inc, a Canadian-based cannabis products company. In November 2017, Constellation acquired 18.9 million shares of Canopy, plus warrants to purchase an additional 18.9 million shares, for \$191.3 million and a 9.9% ownership stake. A year later, the company bought an additional 104.5 million Canopy shares, plus warrants to purchase another 139.7 million shares, for \$3.87 billion and an increased ownership stake to 36.6%. Overall, Constellation invested \$4.1 billion in Canopy in hopes that it would create synergies between the two companies. However, that has not yet been the case.

Canopy has seen its shares drop by around 60% in 2019, with a high of \$52.79 on April 30 to a closing price of \$21.13 on December 12. The company's market capitalization is hurting as well, dropping from \$18.2 billion to \$7.3 billion. Canopy's struggles prompted Constellation to promote its CFO, David Klein, to CEO of Canopy. The news of the change in leadership did cause the stock of the struggling cannabis company to jump, but it is still nowhere near its April high. At the end of 2019, Constellation's \$4.1 billion investment in Canopy was valued at only \$2.6 billion. The majority of Canopy's struggles stem from there not being enough stores to sell its products and its inability to compete against the black market. Forbes estimated that Canopy would need to increase its annual sales in Canada by about \$3 billion to break even. This would take sales of 300,000 to 600,000 kilos, which would be more than half the nation's entire consumption.⁷⁶

In December 2019, Altria became the second Fortune 500 company to invest heavily in the cannabis industry. Altria invested \$1.8 billion in Cronos Group Inc., a leading global cannabis products company. The investment represents a 45% economic and voting interest in Cronos, with the rights to purchase a warrant worth \$1 billion to increase Altria's ownership to 55%.⁷⁷ Altria expected to be able to expand its product development and commercialization capabilities to better position Cronos to lead the cannabis industry.⁷⁸ The company was especially interested in pairing Cronos' products with its vape products to capture a large part of the industry.

⁷⁶ <https://www.investopedia.com/can-constellation-brands-turn-around-canopy-growth-4778833>

⁷⁷ <http://investor.altria.com/File/Index?KeyFile=397052902>

⁷⁸ <https://www.newcannabisventures.com/altria-takes-control-of-cronos-group-with-c2-4-billion-investment/>

Altria's investment has not worked out as expected, as Cronos's share price has dropped by around 67% since the equity investment was finalized, equating to about a \$731 million loss for Altria as of November 2019.⁷⁹ Cronos is facing many similar problems that are hurting Canopy, most noticeably their inability to compete against the black market. However, Cronos is about to launch a hemp-derived cannabidiol (CBD) brand in the U.S., Peace+, that it believes could make a material impact on the company's earnings.⁸⁰

Based off the current status of these two investments, companies may be hesitant to continue to invest in the cannabis industry. However, many problems that affected Canopy and Cronos in 2019 were due to a down year for the cannabis industry. With more regulation and legalization of cannabis expected to occur over the coming years, both Constellation and Altria believe their investments will pay off in the long run. Companies with their highly taxed cannabis products are struggling to compete against the black market. Once government regulation of the industry stabilizes, the cannabis black market could begin to collapse. This would make room for the industry to grow and should increase investment by Fortune 500 companies.

"More and more states became legal and companies are starting to have multi-state operations. So, companies are looking beyond just their current state and the number of new products that hit the market and the awareness for the industry in general was super positive. So, we had just a number of companies reach out to us to hire and I think hiring was higher in the cannabis industry than any other industry.

Just alone in 2019, over 70,000 jobs were created in the cannabis industry which was almost double what it was the last year. So, I think the cannabis industry employs about 300,000 people today across the US, so it's definitely a booming industry and it's projected to grow even though the economy is slowing down a little bit."

-CEO, Specialized Cannabis Staffing Firm

⁷⁹<https://www.fool.com/investing/2019/11/29/heres-how-much-altria-has-lost-on-its-cronos-inves.aspx>

⁸⁰<https://www.fool.com/investing/2019/11/19/heres-the-most-encouraging-sign-in-cronos-groups-l.aspx>

Impact on Higher Education

Online and campus-based degrees that are related to both the business and science of cannabis are expected to remain in demand. However, institutions need to lead and develop relevant degrees without getting too far ahead of the market. Proper market research and well-structured advisory committees at the degree level could minimize the risk of moving out too aggressively.

There may be a market for postbaccalaureate certificates or highly specialized noncredit certificate programs for those entering the cannabis industry with advanced degrees. Various companies, such as Green Flower, are facilitating such programs and providing tailored curriculums to those interested in the industry.

Without rebuilding from scratch, institutions can adapt existing graduate degree programs with specializations in cannabis science or business. An MBA with a specialization in cannabis marketing or operations may not be as far-fetched as one would think.

Agriculture, chemistry and biotech programs might explore further courses, specializations, or new product development programs around incorporating cannabinoids into other substances, recipes, or existing products.

Societal challenges may also yield new programming opportunities around ethics, legal issues, community impact, law enforcement, and many other issues. The financing, accounting, and taxation of the market may also yield programs as local, state, and federal entities incur additional costs as a result or see the cannabis market as a source of revenue. Interstate commerce, as well as the import and export of raw and finished materials, will also evolve.

The cannabis industry “is one of the, if not the, fastest growing industries and there is no training or education for this industry, simply put. There’s a lot of skewed numbers because what they can focus on is what they call the plant touching businesses, which includes cultivation, it includes dispensaries, it includes labs, it includes manufacturing and processing, but what it doesn’t include are the ancillary businesses.”

- Joe Barnard, Head of Curriculum and Accreditation, Green Flower

“The university is a research land grant and the College of Ag, because of its extension, has an obligation and responsibility for workforce development...the broad area of cannabis has got economic impact.”

- Assistant Vice Provost, Public University

“I think cannabis is obviously a new, booming industry and it’s not going to go away. As it continues to grow, there’s going to be more and more demand for people with education in the space and people that are knowledgeable about the various aspects of the lifecycle of the plant and product development. So, I think it’s essential that colleges do start offering a focus area in cannabis because it’s going to be a legitimate and very distinct industry going forward.”

-CEO, Specialized Cannabis Staffing Firm

“In a time where microcredentials and career-oriented degrees and offerings are in greater demand than ever, taking what we know about such needs in higher education and applying the concept to the newest and fastest growing job market - cannabis - makes all the sense in the world. As universities struggle to remain a focal point for students looking for real-world knowledge and applicable skills, the schools who can get in front of the ever-changing legal status and quickly growing job environment will be in an incredible position to serve students of all ages, attainment and previous experience. Legal U.S. cannabis sales have skyrocketed across the country and are expected to eclipse \$15 billion by the end of 2020. Colleges and universities need to find a way to be a part of the solution for an industry with very few knowledgeable employees or prospects and to serve people in other professions such as medicine, nursing, law, banking, HR and more who are everyday more and more affected by this growth. There is tremendous opportunity at this moment in history and we hope the higher education community can recognize and embrace what's coming.”

- *Daniel Kalef, Vice President of University Partnerships, Green Flower*

Appendix

The rise and fall of illegal Cannabis

International legalization status

Cannabis prohibition began in 1961 when the United Nations condemned it as part of its Single Convention on Narcotic Drugs in Vienna, Austria. This international illegalization was further bolstered by the Convention on Psychotropic Drugs of 1971 and the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988. Together, these treaties require that all participants prohibit the possession, use, trade, and distribution of narcotics outside of medical and scientific purposes in addition to joint efforts to prevent international drug trafficking.⁸¹ However, while these treaties have provisions to allow for exceptions based on signatories' constitutions, many legal experts argue that any move towards legalization of use, sale, or possession violates these international accords. Arguments in favor of breaching these agreements include what some countries consider to be the dubious inclusion of cannabis in the treaties' legal frameworks, the increase in the scientific understanding of the drug, and the unintended consequences of what some nations considered to be repressive drug control strategies.⁸² In 2013, the United States, by virtue of Colorado fully legalizing cannabis, became the first nation to defy these treaties. Five years later, the first two nations to fully legalize cannabis on a national level were Uruguay and Canada. It is also worth noting that several nations have unique, specific requirement-based legal statuses that parallel full legalization.⁸³ For instance, the Netherlands allows its citizens to keep and grow some marijuana, and its police force allows coffee shops to sell marijuana so long as it is not sold to minors. Another example is that Spain permits the existence of marijuana clubs which are locations in which its citizens can purchase the drug for recreational use, but marijuana is still officially illegal to sell.

North American legalization status

Canada had long since legalized medicinal marijuana, when in 2000 the Canadian Supreme Court ruled that Canadians have a constitutional right to use cannabis as medicine.⁸⁴ Eighteen years later would see an even more dramatic legal change in the U.S.' northern neighbor. The Cannabis Act, signed into law by Prime Minister Justin Trudeau, created a strict legal framework for cannabis. Some of the legal measures include tracking requirements of cannabis from "seed to sale" to keep cannabis out of the black market as well as an age restriction of 18 years to purchase and use cannabis products. Additionally, the sale of cannabis edible products and concentrates was to be delayed until approximately one year after the law came into force on October 17th, 2018.⁸⁵ Perhaps the most significant aspect of cannabis legalization in Canada is

⁸¹ <https://www.vox.com/2016/5/8/18089368/war-on-drugs-marijuana-cocaine-heroin-meth>

⁸² <https://www.tni.org/en/publication/the-rise-and-decline-of-cannabis-prohibition>

⁸³ <https://www.vox.com/identities/2018/8/20/17938416/marijuana-legalization-world-uruguay-canada-netherlands>

⁸⁴ <https://london.ctvnews.ca/medicalmarijuana/a-timeline-of-some-significant-events-in-the-history-of-medical-marijuana-in-canada-1.3858860>

⁸⁵ <https://www.justice.gc.ca/eng/cj-jp/cannabis/>

that it is the first country in the Group of Seven (G7) to legalize recreational marijuana.⁸⁶ The G7 holds substantial political and economic clout, and Canada's legalization of recreational marijuana is seen as normalizing the drug's use.

Developments south of the U.S. border are similar to what has occurred in Canada. In 2009, as part of an effort to treat addiction as a public health issue rather than criminal offense, Mexico decriminalized the possession of five grams of marijuana in addition to "personal use amounts" of cocaine, heroin, and other drugs.⁸⁷ Following a Mexico Supreme Court 2018 ruling that an absolute ban on recreational marijuana was unconstitutional, newly elected Senator Olga Sánchez Cordero introduced a marijuana legalization bill as the Mexican debate on cannabis legalization continues.⁸⁸

⁸⁶ <https://www.usatoday.com/story/news/2018/10/17/marijuana-now-legal-canada-but-buying-weed-remains-challenge/1672074002/>

⁸⁷ <https://www.rollingstone.com/culture/culture-features/legal-pot-in-mexico-everything-you-need-to-know-194984/>

⁸⁸ <https://www.npr.org/2018/11/14/667699301/mexico-hopes-to-legalize-marijuana>