

THE HARVEST REPORT

VOL. 2 - FALL 2018

A LOOK AT
COMING TRENDS IN THE
COMMERCIAL CANNABIS INDUSTRY



RESEARCHED, WRITTEN,
AND PRESENTED BY:



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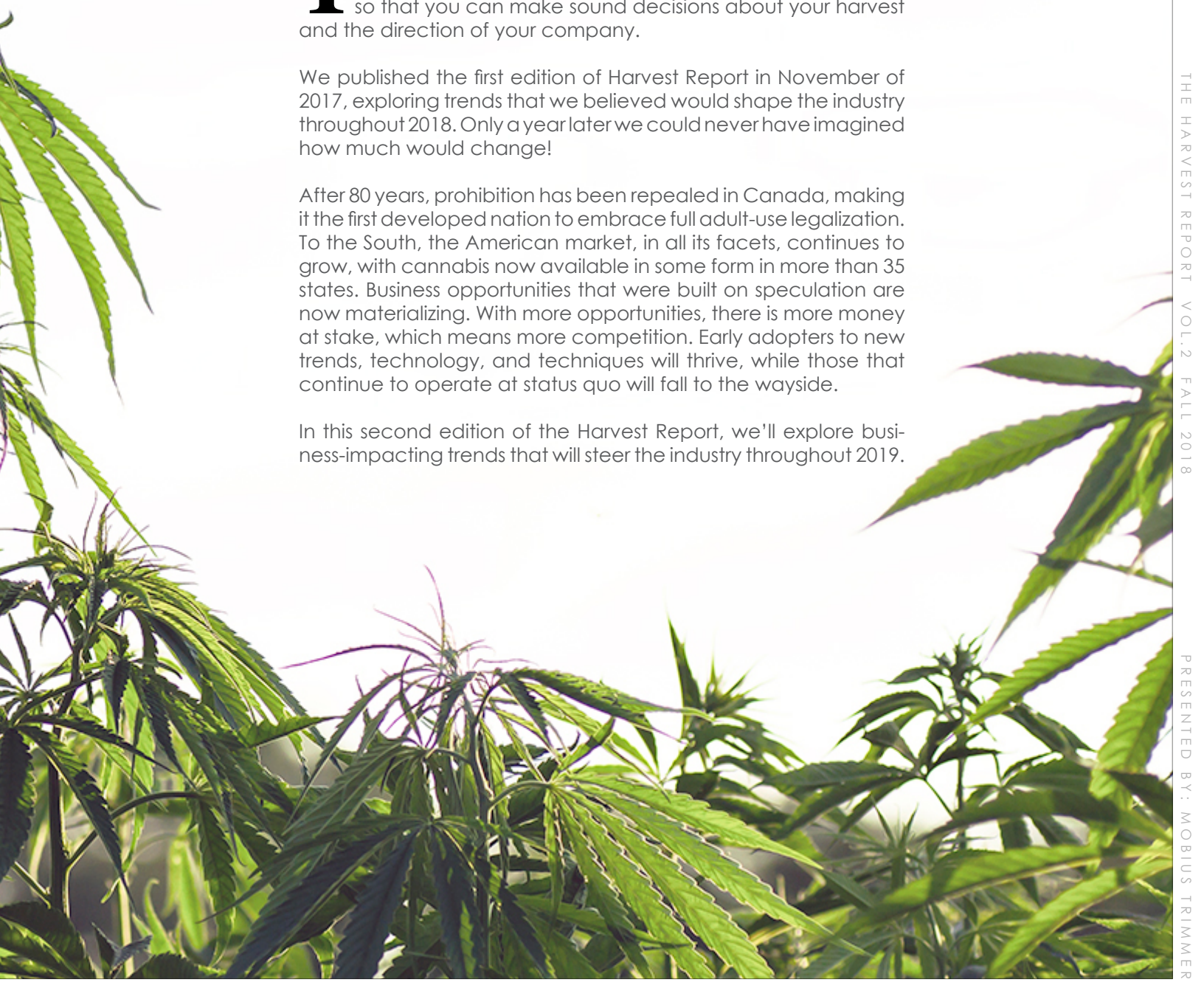
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The Harvest Report provides you well-researched insight into what comes next in the cannabis harvesting sector, so that you can make sound decisions about your harvest and the direction of your company.

We published the first edition of Harvest Report in November of 2017, exploring trends that we believed would shape the industry throughout 2018. Only a year later we could never have imagined how much would change!

After 80 years, prohibition has been repealed in Canada, making it the first developed nation to embrace full adult-use legalization. To the South, the American market, in all its facets, continues to grow, with cannabis now available in some form in more than 35 states. Business opportunities that were built on speculation are now materializing. With more opportunities, there is more money at stake, which means more competition. Early adopters to new trends, technology, and techniques will thrive, while those that continue to operate at status quo will fall to the wayside.

In this second edition of the Harvest Report, we'll explore business-impacting trends that will steer the industry throughout 2019.

“

INITIALLY, FLOWER PRICING WAS HIGH BECAUSE IT COULD BE. PEOPLE WERE JUST EXCITED THAT IT WAS LEGAL AND THEY DIDN'T QUESTION THE PRICES. BUT OVER TIME WE'VE SEEN A RACE TO THE BOTTOM.

”

MATT GILLESPIE OF HYBRID MARKETING CO

COMMODITIZATION

Commoditization is defined as the process in which goods or services become nearly indistinguishable from competing offerings over time. Commoditized products within specific categories are often so alike to one another that the only distinguishing feature is pricing.^[1] This usually occurs in markets where supply is high vs demand, and leads to a decline in pricing and narrowing of profit margins.

Executives from across the spectrum of Canadian LPs agree that commoditization of cannabis is inevitable in the Canadian market. There is no reason to believe that the Canadian cannabis industry will escape the same fate as Colorado, Oregon, or Washington, where commoditization has occurred (to some degree) in each. According to Matt Gillespie of Hybrid Marketing Co based in Denver, "Initially, flower pricing was high because it could be. People were just excited that it was legal and they didn't question the prices. But over time we've seen a race to the bottom." An even more extreme case can be seen in Oregon, where a poorly structured licensing process has led to an oversupply of more than 1 million pounds of dried flower, sending wholesale and retail prices crashing on all cannabis products (including edibles and extracts).^[2]

The question in Canada: When will commoditization occur? We have identified a variety of levers that will impact supply, demand, and product differentiation, thus influencing the commoditization process.



1. WHEN WILL THE WAVE OF MEGA-GREENHOUSES COME ONLINE?

Every LP is currently scaling up. The measuring stick of the moment is "funded-capacity", meaning the size of an expansion that's been fully-funded, even before ground has been broken. What we are more interested in is operational capacity. How much is being grown? Many LPs now have new, super-size facilities about to come online, with many more becoming fully-operational over 2019. Aurora Sky, Aurora's new flagship facility in Edmonton, Alberta, is gradually ramping up production, rolling out one grow bay at a time. When fully operational, (which is expected by the end of 2018) this facility will produce 100,000 kg/year of dried cannabis. Canopy Growth, Green Organic Dutchman, CannTrust, Aphria and several others all have similar-sized facilities going online in 2019. When online, these massive greenhouses will have a drastic impact on supply.

2. WHEN WILL EXPORT VOLUME BECOME SIGNIFICANT?

Most of the large LPs have big plans outside of Canada, with many of them already exporting to countries like Germany, Italy, Australia, New Zealand, the Czech Republic, and others. Seven LPs have already been granted export licenses. Tilray alone, for example, has completed exports to 11 foreign markets. To date, most of these exports have been nominal amounts, more useful for PR and process testing.

That will change throughout 2019 as Canadian LPs streamline their export processes and begin to put a legitimate dent in the supply side of the international markets. The speed at which Canadian LPs can enter these markets will have an impact on the supply in Canada.

3. WHEN WILL MARKETING RESTRICTIONS EASE?

The marketing restrictions introduced with bill C-45 are very prohibitive. Celebrity endorsers are banned, packaging is basically blank except for a company logo, and even sponsorship of events such as music festivals have been restricted. LPs have tested the Health Canada response to these rules (Aurora's Illuminate concert series has held big-name music events all over Canada. Tweed has sponsored a variety of events and music festivals.) The response has been "concern" from Health Canada, with them making the statement that they have been "abundantly clear" about what is and isn't permitted.^[3] In that same statement, Health Canada says, "the contravention of the existing prohibitions can also result in criminal liability." They are making known their intentions to tightly enforce the marketing restrictions, and will not hesitate to penalize LPs that seek to bend or test the rules. However, the marketing restrictions laid out in bill C-45 are merely a starting point, and will not be sustainable. As the new cannabis industry lobby continues to grow in power and influence, we expect amendments to loosen up on marketing, adding to the ability of LPs to differentiate their products. We look to October of 2019, one year after legalization, for this to happen (potentially as part of the amendment package for edibles and extracts. See point #5 below).

4. HOW MANY MORE LPS WILL BE GRANTED LICENSES?

As of this writing there are 127 Canadian Licensed Producers, with another 500 in the pipeline at various stages. As consultants become more experienced with the appli-

cation process and Health Canada speeds up their review process, (the current record is 10 months from application to acceptance) we expect to see many more LPs come online throughout 2019. This will increase the supply, and, as stated above, a high supply vs demand encourages competition on price.

5. WHEN WILL EDIBLES, EXTRACTS, AND INFUSED BEVERAGES BE ALLOWED FOR SALE?

The initial grouping of products that consumers in Canada will be purchasing throughout 2019 excludes edibles and extracts. In bill C-45, it was stated that amendments will be made within one year that will allow (and regulate) the sale of these products. Predictions are difficult how they will be regulated, but an increase in the number of product categories will aide LPs in product differentiation, which is part of the strategy to counteract commoditization.

6. WHEN WILL OTHER COUNTRIES LEGALIZE?

Canada has first-mover advantage in the global cannabis industry, but eventually, other countries will legalize as well. To some degree, they'll provide their own supply, which will impact Canadian exports. Many countries are already establishing their own medical cannabis industries. In November, the World Health Organization is conducting a thorough review of their classification of cannabis. If they decide to change, that could have a cascading effect, speeding up the legalization process throughout the world.

The variability of all of the above levers will determine when and to what degree we will see commoditization occur in Canada. Opinions in the executive ranks vary as well. Aurora Cannabis CEO Terry Booth claims, "we've got five years before that happens."^[4] That contrasts to the view of CEO Bruce Linton at Canopy Growth, who already views cannabis primarily as an ingredient, preferring to use that term over "commodity."



EXAMPLES OF PRODUCT DIFFERENTIATION. CLOCKWISE FROM LEFT:
TWEED OIL BLEND | HYDROPOTHECARY CAPSULES | TILRAY CBD EXTRACT

He explains, “the pressure on the price of the ingredient will have almost no bearing on the final sale price.”^[4] While that does not appear to be entirely true (margins for products in Colorado have dropped about 24% since 2016, as well as wholesale and retail prices), his point is that we need to consider a strategy for commoditization now. To followers and participants of this industry, it's very clear that it is moving at an ever-accelerating pace. That is why our

prediction falls in the middle of the opinions of Booth and Linton. We predict that the forces of commoditization will begin to appear and impact the industry as soon as the second half of 2019. To continue to succeed past the initial flash-pan hype of legalization, cannabis businesses need to have strategies and plans in place to combat commoditization, which leads us into our next segment.

MARKETING WILL MATTER

The above discussion on commoditization flows perfectly into perfectly into our next topic, as it's the weapon against commoditization: marketing. Marketing in the cannabis industry has evolved, greatly. But, just as it seems as though every state (or country) likes to start from scratch on their regulatory framework, cannabis businesses in newly-legalized areas largely do the same thing with their marketing. While there are standouts, marketing is generally weak at the point of adult-use legalization. "What we saw in Colorado, when adult-use legalization happened in 2012, was that everybody wanted to be the 'cool' brand," says Matt Gillespie from Hybrid Marketing Co, "most companies just tried to appeal to the typical stoner stereotype. There wasn't much thought put into it."

Marketing and branding become more sophisticated as the market develops, but there is no escaping this simple fact: when legalization occurs, most companies see little impact from marketing spend. Because there is no clear and immediate ROI, many companies ignore it. That initial "minimal impact" doesn't last forever though. According to Ryan Hellard, CMO at Canadian Licensed Producer Sundial Cannabis, "At the start, anything on the shelves is going to sell. So, while the ROI might appear to be low initially, building that solid foundation so that you stand out and continue to acquire customers 12-18 months down the road, that's just as important."

Consider the typical market trajectory seen to the right, starting from the point of legalized adult-use sales.

1.
YEAR

NOVELTY

Being able to buy cannabis is a novelty. Demand vastly exceeds supply. If you have cannabis for sale, people will buy it. Marketing seems like an unnecessary expense, especially to the CFOs determining the budget. Marketing ROI at this point is very low.

2.
YEAR

NORMALIZATION

The novelty wears off and normalization occurs. People begin to look for more than just a storefront to purchase their product.

3.
YEAR

COMMODITIZATION

Commoditization sets in. Wholesale cannabis prices drop. Competition on price begins between brands and products that haven't invested in marketing.

4.
YEAR

ADVANTAGE

As the supply pipeline fills in, the first-mover advantage has dissipated. Owning a cultivation or dispensary license is no longer a lottery ticket.

5.
YEAR

LEVELING

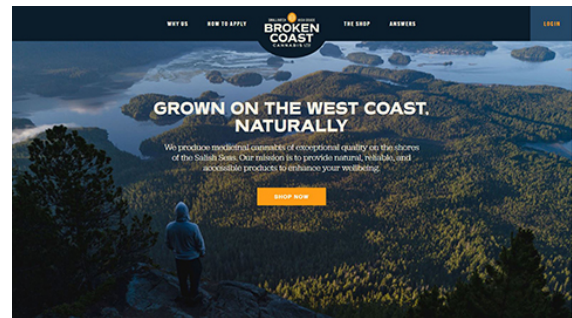
Sales level out. The market hits its saturation point, and the hockey-stick-growth begins to flatten.

The 3 Year Itch.

It's at this point, between 2-3 years post-legalization, that businesses begin to realize their ROI on marketing. "Looking at the Canadian market, in a few years we'll have brands that invested in building a narrative, building a story from the start. Those are the brands that will become institutions," says Matt Webb of Webb Creative, the design firm behind Doja and Broken Coast, "The brands that didn't, they'll become the commodities." What may have seemed like an unnecessary expense a few years back becomes a foundational reason that stand-out businesses continue to thrive.

WHY DOES THIS MATTER TO CULTIVATORS, AND HOW DOES IT RELATE TO CULTIVATION TECHNIQUES?

Everything about your business that you choose to reveal to the public has potential marketing value, and cultivation is no different. Your cultivation facility and harvest are perhaps your greatest assets for creating fresh content for marketing use, particularly for Canadian producers where the limitations on marketing are extreme.^[5,6,7] Consider including your cultivation or harvest in your marketing strategy. If you use novel cultivation techniques, have a unique harvesting process, an interesting look to your facility, or are going to be harvesting a rare strain, these can be used to create content.



THE BROKEN COAST SITE FOCUSES ON THEIR LOCATION AND GROWING METHODS AS PART OF THEIR MARKETING.

Transparency is powerful, we urge you to embrace it. Open up your facility and processes to the outside. Today's consumers love knowing how their product is made, where it comes from, and the journey it takes to get to them. Aaron Rosenbluth at Hybrid Marketing Co says, "it's about being able to tell that story from seed to shelf. The consumer wants to know how their product is made and who made it. Being more open about your processes is a valuable thing." Understanding the back-story of their products add to the customer experience when they ultimately ingest them, in whatever form it may be.

Canada.

It's true that the Canadian market is a very different animal compared to any of the adult-use U.S. states. With the legal framework of the ACMPR (*Access to Cannabis for Medical Purposes Regulations*) creating Federally Licensed Producers (LPs), the entire country went medically legal at once, and now recreationally legal at once. In the US states that have legalized, the countdown to marketing importance really began at the point of legalization. Canada becoming federally-legal meant that it avoided many of the growing pains of the state markets in the U.S. Investor money poured in. However, that doesn't mean Canada will escape this model, it just means

it's happening faster. Canada seems to have jumped the queue by several years. Despite the laws, both brick-and-mortar dispensaries and online dispensaries have been around for years, with no prescription of any kind needed. Enforcement has been more annoyance-level rather than prohibitive for most of these black or grey market businesses. Wholesale grey and black market prices are down 60-70% compared to three years ago. So while marketing may not pay off on launch day, it will make a massive impact very shortly afterwards. That's why we're saying **high-quality marketing is a trend to watch for in 2019.**

“IF YOU CAN WEAVE THE STORY OF YOUR CULTIVATION, THE STORY OF YOUR FACILITY, HOW YOU DO THINGS, INTO A BIGGER STORY OF QUALITY, OR CONSISTENCY, I THINK THAT WILL WORK WELL. IF YOU'RE LOOKING TO SELL A HIGHER-QUALITY OR PREMIUM PRODUCT, THEN YOU'LL WANT TO BE ABLE TO COMMUNICATE WITH YOUR CUSTOMERS AS TO WHY THEY CAN EXPECT A HIGHER QUALITY PRODUCT. HOW YOUR PARTICULAR METHODS WILL ENSURE THE CONSISTENCY OF YOUR PRODUCT.”

RYAN HELLARD - CHIEF MARKETING AND PRODUCT OFFICER, SUNDIAL

Actionable Insights:

- If you are in the early days of your business, start with a strong branding foundation that is unique and stands out against competitors. Invest in a marketing plan right from the start. Ask yourself, why would somebody buy my products over my competition, if our prices are on par? If you can't answer that question, you'll have problems, and you'll have them sooner rather than later. Consider using an outside agency, especially an agency that doesn't work exclusively in the cannabis space. A fresh perspective can generate valuable ideas.
- Use your facility, harvesting process, and cultivation techniques as tools to generate valuable, insightful marketing content. The possibilities here are endless, and always changing as you grow new strains, create new products, and expand your facility. Remember, customers love transparency!



INSIDE THE GREEN RELIEF FACILITY. PHOTO CREDIT: [GREENHOUSECANADA.COM](https://www.greenhousecanada.com)

GOING GREEN

Perhaps because it's a plant, the consumer's perspective of cannabis has largely been that it's an environmentally-friendly alternative to other, synthetic substances. That's simply not true. "I've never come across any other agricultural crops that have the environmental consequences of cannabis," says Chris Van Hook of Clean Green Certified. Ten years ago, quality black and grey market cannabis was almost entirely grown indoors. Growers used enormous amounts of energy to power 1000 watt lights as well as AC units. Water was often diverted from rivers. Pesticides were used universally, but because they were operating outside the law they often used much more than would be legally allowed in standard crops. Worse, some even used banned pesticides like carbofuran, that are lethal to flora and fauna even in small doses.^[8] "When we started in 2004, there was no understanding that pesticides were used in cannabis," according to Van Hook, "The concept of using organic growing methods, reducing your carbon footprint, recycling water, that just wasn't the way people grew weed. In fact, the attitude was that good cannabis could not be grown organically."

In the U.S, use of the term "organic" is controlled by the FDA. Because cannabis remains federally illegal, and the FDA is a federal organization, there was no way to legally certify cannabis as organic. That was the purpose for establishing Clean Green Certified. It's a 3rd party auditing and certification program that certifies members as adhering to a list of cultivation practices that would be in line with organic, sustainable, and "green." According to CGC, these criteria primarily fall into three categories:

1. POWER CONSUMPTION
2. PESTICIDE USE
3. WATER USE

Starting in 2010, Clean Green Certified growers began winning Cannabis Cups, proving that high-grade cannabis could be grown organically. Looking to the world outside of the cannabis industry, consider the following data points:

Organic food sales in 2007 in the United States were worth \$18 billion. Ten years later in 2017, organic food sales topped \$47 billion. We see this not only with the increase in sales but with big businesses getting involved, like General Mills and Amazon (recent purchase of Whole Foods.)^[9,12]

Global juggernaut Unilever said that of its hundreds of brands, those such as Dove, Hellmann's and Ben & Jerry's, that have integrated sustainability into both their purpose and products delivered nearly half the company's global growth in 2015. Collectively, they are also growing 30% faster than the rest of the business.^[10]

Nielson data finds in their studies that 66% of global respondents say they're willing to pay more for products and services that come from companies that are committed to reducing environmental impact.^[11]

The trend outside the cannabis industry is clear: consumers are shifting their buying habits towards companies that use sustainable methods, and in the case of consumed goods, offer organic. Is this general trend crossing over to the cannabis industry? The answer is overwhelming: YES. As Canadian LPs scale-up, not only are these concepts gaining ground as discussion points in the cannabis industry, but they are completely overhauling cultivation methods, almost from top to bottom. 1000 watt bulbs are being replaced by advanced LED lighting from companies like Fluence Bio-engineering. Traditional pesticides are being phased out for alternatives considered more natural, (such as predatory insects and insecticidal soaps).^[13] Light-deprivation greenhouses are becoming the norm for the largest-scale cultivators, replacing indoor facilities that have massive energy footprints because of the power requirements for lighting and environmental controls. Water is more commonly recycled than diverted and drained as waste. According to Green Relief CEO Warren Bravo, "if people aren't latching on to sustainable practices now, they are going to be dinosaurs in this industry."

Green Relief is an excellent example of an organization that has not only embraced sustainability as a guiding principle in their business, but extended it into their entire cultivation process by using the uncommon aquaponics growing methodology. This makes them the only aquaponics grower of cannabis in the world (that we know of). "We've got a growing methodology, aquaponics, that uses



PHOTO CREDIT: ELAMBOROUGHREVIEW.COM

90% less water and produces no water waste. We use LED lights, and our facility is housed in an earth-sheltered building that reduces our power needs," says Bravo. It sounds expensive, and it certainly does take more up-front investment to embrace many of these technologies. However, the production costs will drop over time, and even more so as they expand. "By using these practices and paying the costs up front, it actually allows us to save more money moving forward. We're producing at \$1.42 per gram, and that's just in our 32,000 square foot facility. We'll be reducing that number drastically when our 240,000 square foot facility is up and running."

The sustainability trend is a big one, and as Canadian LPs come online throughout 2019, will only continue to grow in importance, as it shapes cultivation, harvesting, and the technologies driving change in these sectors.



GREEN RELIEF IS AN EXCELLENT EXAMPLE OF WHAT WE SUGGEST IN THE MARKETING WILL MATTER SECTION. THEY'VE BUILT THEIR BRAND AND MARKETING STRATEGY AROUND THEIR UNIQUE CULTIVATION METHODOLOGY, DIFFERENTIATING THEMSELVES FROM OTHER CANADIAN LPS.

PHOTO CREDIT: ELAMBOROUGHREVIEW.COM

What is Aquaponics?

Aquaponics is a combination of aquaculture (raising fish) and hydroponics that grows both fish and plants together in an integrated system. The waste produced by the fish fertilize the plants, which in turn purify the water.] ^[14]

SUSTAINABILITY HAPPENS IN A LOT OF WAYS. GROWING METHODOLOGY, AND USE OF RESOURCES, IN OUR CASE. TO BE AN ENVIRONMENTAL STEWARD, AND GOOD CORPORATE CITIZEN, YOU NEED TO LATCH ON TO SUSTAINABLE TECHNOLOGIES. THE TREND IS GOING TOWARDS CLEAN, ALL-NATURAL PRODUCTS, AND WE'RE HAPPY TO BE A PART OF THAT TREND. PEOPLE REALLY DO CARE ABOUT WHAT THEY CONSUME, AND PEOPLE REALLY DO WANT TO SUPPORT CAPITALIST COMPANIES WITH A CONSCIENCE.

WARREN BRAVO - CEO, GREEN RELIEF

Actionable Insights:

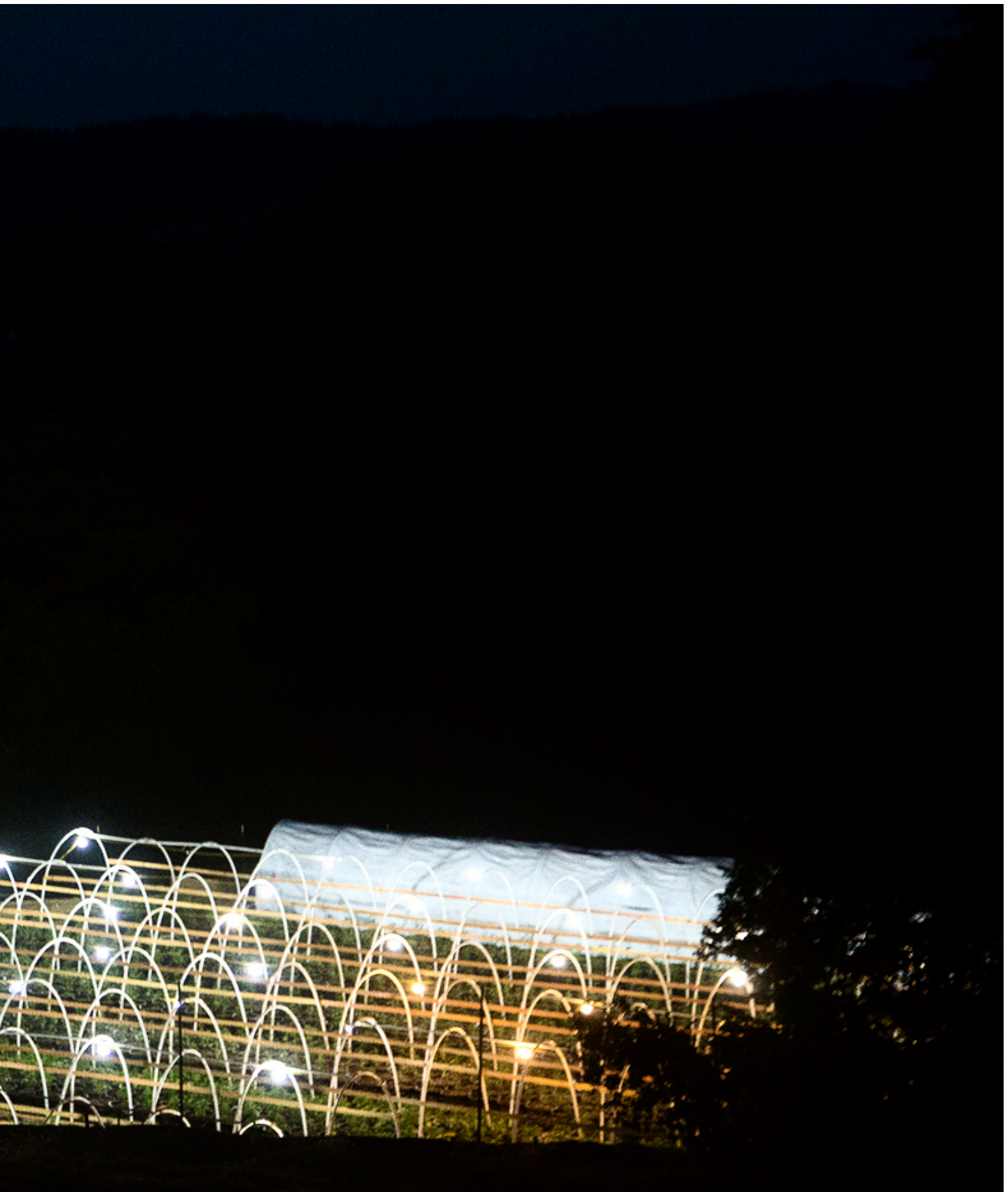
- When possible, choose practices and technology considered "sustainable" and build marketing content around these practices. Remember, if you don't tell anyone, it didn't happen.
- Consider new technology outside of what's traditionally used, and make sure to explore the cost / benefits analysis. Technologies like LED lighting, that didn't work very well 5 years ago, have come a long way. They might cost more up front, but the long-term savings can be substantial.
- If your target market includes millennials, remember that sustainability is a shopping priority for them. Try to target them with specific messaging that tells them about your green practices.

FOLLOW-UP: 1 YEAR LATER

UPDATES ON OUR PREDICTIONS AND TRENDS FROM HARVEST
REPORT VOLUME 1, RELEASED IN EARLY 2018.

1. EXTRACTIONS ARE TAKING OVER | 2. AUTOMATION FROM SEED TO HARVEST





1. EXTRACTIONS ARE TAKING OVER

In the last edition of the Harvest Report, we explored the growing popularity of extracts, and how they were growing in market share compared to dry flower. This, along with thinning margins on dry flower in some markets, had forced many producers to rethink their harvesting methods. Some had been turning to extracts-first, with dry flower being secondary, if they produced any dry flower at all. This trend continued throughout 2018. Q1 2017 in Oregon, for example, flower accounted for 54% of dispensary sales, compared to 32% for concentrates and edibles (extracts). Only a year later in Q1 2018, flower had dropped to 44% while concentrates and edibles rose to 43%.^[15] This continued realignment of product popularity and priority is impacting the cannabis industry in several ways.



1. THE SCALE OF EXTRACT PROCESSORS IS GROWING

"We are selling much bigger systems than we were only a year ago," says Mike Mulligan of Apex Supercritical, "in fact, we stopped manufacturing our desktop unit 8 months ago." Processors are looking for cost reductions by scaling up their production capacity, especially in markets that are seeing a rapid decline in wholesale prices (the weekly spot index ending August 24, 2018 had outdoor-grown flower in Oregon at a volume-weighted average of \$371 USD per pound, the lowest price ever observed in any market.)^[16]

2. INCREASED SCALE IS DRIVING CO₂ AND ETHANOL EXTRACTION.

These two methods are becoming the standard, particularly for the largest Canadian LPs. Processors that want a premium product are opting for CO₂, while ethanol is being used for lower-end distillates. Driving the CO₂ extraction technology is Health Canada's determination that you can't add anything to the end-product that didn't originate with the starting material. That contrasts with the policy in most legal US states that allows terpenes to be bought off the shelf, then injected back into any product, (which is common with ethanol extraction).

3. THE B2B CUSTOMER PERSONA IS CHANGING.

According to Pete Patterson, CEO of Vitalis Extraction Technology, "when we first started in this business in 2016, the questions from potential customers were basic. They might ask about volume, and that's really it. Now we're seeing more sophisticated procurement processes, people asking more questions about GMP [see more below]. There are extremely educated scientists involved now, and they're coming to the table with a very advanced understanding of extraction technology." These changing personas are a sign of the maturation of the industry and at least partly due to the gradually-fading stigma associated with cannabis businesses. We expect this trend to continue as the science of cannabis extraction continues to develop, and businesses continue recruiting employees with advanced science backgrounds to lead their extraction groups.

4. GMP (GOOD MANUFACTURING PRACTICE) HAS BECOME A PRIORITY.

While GMP is not currently required in any North American cannabis-producing market, the industry is self-regulating to some extent, and many companies are choosing to hold themselves to GMP standards. 3rd party GMP certifications have become common in cannabis facilities, and manufacturing extraction equipment that has been designed for a GMP-workflow has been a big advantage for companies like Vitalis. Says Patterson, "our customers are requiring that our extraction technology be able to comply with not only Canadian GMP standards, but the stricter GMP standards in Europe."

5. EXPORTS ARE ON THEIR WAY.

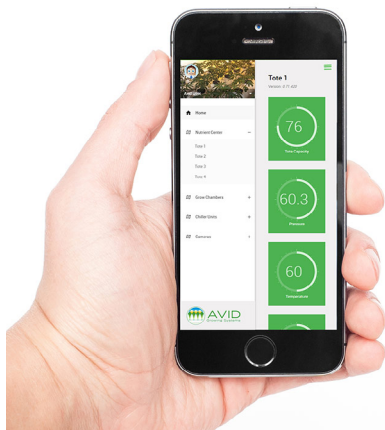
Here in Canada, part of the drive to scale up extract production capacity by the big LPs is their sales and exports to the rest of the world, Europe in particular, (which is the reason some LPs are applying European GMP standards.)

Canada has said that extracts will be allowed within one year of adult-use legalization. "We expect to see 3-5 different extract types permitted by Health Canada within 2019," Patterson says, "if you look to the grey market dispensaries, extracts are the top seller in many of them. Legalizing a broad range of extracts will be necessary to compete with the black market." Many of the state markets in the US already permit a spectrum of extracts, but these markets are isolated, with different rules and standards applied in each one. That's why the rest of the world is looking to Canada for standardization, scale, and leadership in extraction technology. We'll see that story develop throughout 2019.

2. AUTOMATION FROM SEED TO HARVEST

In the Automation section of the 2018 Harvest Report, we described cannabis facilities where every system was highly automated. From the lighting, water and feed systems, environmental controls, and movement of plants through the facility, automation was the primary way that cannabis facilities would be able to lower the cost of production, ensure product

consistency, and maintain QA standards. At the time of our writing, the methods of automation we described were common in other forms of indoor horticulture, but the cannabis industry was behind in its adoption. For 2018, we predicted a sharp ramp-up in adoption of automation in all growing, harvesting, and greenhouse operations. We were right.



EXAMPLES OF AUTOMATION IN INDOOR CANNABIS FROM AVID GROWING SYSTEMS - A PROVIDER FOR LARGE-SCALE, VERTICAL GROWING SYSTEMS, BUILT EXCLUSIVELY FOR THE CULTIVATION OF MARIJUANA - LOCATED IN NIAGARA FALLS, ONTARIO

PHOTOS COURTESY [AVIDGROWING.COM](https://www.avidgrowing.com)

At the time of the previous publishing, the large facilities that are now coming online were still in the beginning stages of build-out. Cannabis growing and harvesting techniques were primarily based on a scaling-up of grey and black

market processes. That has now changed, surprisingly quickly. There are several reasons we can now point to for this rapid advancement of automation.

1. BETTER ADVISORS

The initial crop of growers involved in the legal cannabis industry came from the grey and black market. The techniques used in the old grey and black market rarely depended on automation of any kind. It wasn't necessary. Many of these growers have evolved and excelled in the new cannabis industry, but as the industry stigma disappears, there are now more facility managers that have backgrounds based in horticulture and agriculture. This new breed of master growers started with bachelors or advanced plant-science degrees, and then adapted their knowledge base to large-scale cannabis growing. It's the reverse trajectory of those that started with black-market cannabis growing. These new managers are comfortable with automation techniques, understand their importance, and are more likely to recommend them to their COOs. Another way to put it: The knowledge base in the cannabis industry has grown, drastically.

2. SCALE.

A year ago, everybody was talking about bigger and bigger facilities. 300,000 square feet, 400,000 square feet, 1 million square feet. But, at that point, nobody was actually operating facilities at that scale. Most of them were in the planning stages. Now, these large-scale facilities are finally coming online. When another 800,000 square foot facility is announced, industry insiders barely blink an eye it's so common. At that scale, it's simply not possible to operate without high-levels of automation included in the facility, usually designed this way from the start. Moving plants and materials around a 10,000 square foot indoor facility is not a concern. But that changes when you're talking about a greenhouse that's so large you can't see the other side of it. This goes for the harvesting process as well. Hand-trimming is not an option when you consider that these large facilities will be processing 100,000 kg per year.

3. PRICE COMPETITION

Business operating these massive facilities are competing on price. Production cost per gram, or claiming to be the "low-cost leader" has become a badge of honor for the largest companies. You can't compete on price without automation. That's especially true if your competition is adopting automation tools and techniques; you must do the same to remain competitive.

It's clear that the trend towards as much automation as possible in the cultivation and harvest processes will continue throughout 2019. Aurora's Sky facility, for example, does not even need humans in the grow rooms. The unprecedented level of automation at Sky is being scaled-up further at Aurora Sun, a facility that will be cultivating 1.2 million square feet of growing space (and will come online Q4 of 2019).^[17] Further, elements of automation will become the norm in mid-sized and even small-scale growers as well. Many consumers will be happy to pay a premium for "craft" cannabis, (as has been proven in the beverage world), but the pricing must still be in the ballpark of the low-cost producers. Automation will allow the small growers to stay within striking range.

THE HARVEST SPOTLIGHT

A LOOK AT THE COMPANIES WHO GAVE THEIR
TIME TO PROVIDE PERSPECTIVE AND INSIGHT
ON THE TOPICS DISCUSSED IN THIS REPORT.

Webb Creative

WEBBCREATIVE.CA/



Responsible for the Doja and Broken Coast brand identities, Matt Webb was consulted for his thoughts about the impact of Health Canada regulations on branding and marketing of cannabis products.



Sundial believes in health, happiness and personal well-being. Their cannabis is carefully cultivated for modern consumers - people looking for a natural alternative that fits today's active lifestyles



GREENRELIEF.CA/



Green Relief is the only licensed cannabis producer in the world growing with aquaponics — a soil-less form of sustainable agriculture where fish and plants are grown together in a natural ecosystem environment.



APEKSSUPERCritical.COM/

Since 2001, Apeks Supercritical has been designing, refining, and manufacturing botanical oil extraction systems utilizing sub-critical and supercritical CO2 — a cleaner, safer, purer, and faster way to extract plant oils.



VITALISET.COM/

With deployments across the globe, Vitalis Extraction Technology is an award-winning manufacturer of industrial-scale supercritical CO2 extraction systems and one of the only ASME accredited manufacturers in the industry.



CLEANGREENCERTIFIED.COM/

Clean Green Certified is the number one certifier in North America for cannabis cultivated using sustainable, natural and organically based practices.



HYBRIDMARKETINGCO.COM

Hybrid Marketing Co. is a forward-thinking collective of marketing veterans who are passionate about removing the stigma surrounding cannabis to drive the industry forward.



HOVEINTL.COM/

HOVE International has been helping growers in North America for over thirty five years, specializing in commercial horticulture and cannabis production.

USEFUL LINKS

A LIST OF SITES WE MENTION IN THIS DOCUMENT,
OR VARIOUS PAGES OF GENERAL INTEREST.

COMMODITIZATION

- [1] **WHAT IS TO 'COMMODITIZE'**
INVESTOPEDIA.COM
- [2] **MARIJUANA PRICES CRASHING IN OREGON AFTER STATE
STOKED WEED GLUT**
CBSNEWS.COM
- [3] **STATEMENT ON EVENT SPONSORSHIP AND OTHER PROMOTIONAL
ACTIVITIES BY FEDERALLY LICENSED PRODUCERS OF CANNABIS**
CANADA.CA
- [4] **WHAT CANADA'S TOP CEOS SAY ABOUT CANNABIS
'COMMODITIZATION'**
MJBIZDAILY.COM

MARKETING WILL MATTER

- [5] **ADVERTISING PROHIBITIONS ON CANNABIS**
CANADA.CA
- [6] **LICENSED CANNABIS PRODUCERS NAVIGATE HEALTH
CANADA'S MARKETING AND BRAND REGULATIONS**
STRAIGHT.COM
- [7] **BILL C-45**
PARL.CA

- [8] BANNED PESTICIDES FROM ILLEGAL POT FARMS SEEP INTO CALIFORNIA WATER**
USATODAY.COM
 - [9] ORGANIC FOOD IS PRICIER, BUT SHOPPERS CRAVE IT**
USATODAY.COM
 - [10] A THIRD OF CONSUMERS PREFER SUSTAINABLE BRANDS**
UNILEVER.COM
 - [11] MILLENNIALS SAY SUSTAINABILITY IS A SHOPPING PRIORITY**
NIELSEN.COM
 - [12] ORGANIC FOOD SALES IN THE UNITED STATES 2005 TO 2017**
STATISTA.COM
 - [13] HEALTH CANADA TESTING OF CANNABIS FOR MEDICAL PURPOSES FOR UNAUTHORIZED PEST CONTROL PRODUCTS**
USATODAY.COM
 - [14] AQUAPONICS**
WIKIPEDIA
-

- MOBIUS TRIMMER**
MOBIUSTRIMMER.COM
- COMMERCIAL CANNABIS GLOSSARY**
MOBIUSTRIMMER.COM/COMMERCIAL-CANNABIS-TRIMMING-GLOSSARY/
- THE ULTIMATE GUIDE TO GMP CERTIFICATION**
MOBIUSTRIMMER.COM/GMP-CERTIFIED-CANNABIS-TRIMMING/