

JULY / AUGUST 2016

# CANNABIS

## BUSINESS TIMES

### GENE WARS

(AND HOW THEY COULD AFFECT  
GROWERS EVERYWHERE)

THE 'GREEN RUSH'  
FALLACY

TIPS FOR  
NAVIGATING  
280E

RIPE FOR  
CONTROVERSY:  
ARE YOU WAITING TOO  
LONG TO HARVEST?

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# Risky Business

If one message speaks loud and clear from this issue, it's that more challenges and risks face cannabis cultivators than many people realize. It's not an "if you build it, they will come" scenario, to say the least. Of course, if you're in this market, you know this all too well.

In this issue's Guest Column, "The Green Rush Fallacy" (page 26), cultivator/business owner David Bonvillain outlines a boatload of these challenges. We've all talked about them, and written about them in bits, but to see them all listed together should give wannabe business owners a better idea of the landscape ahead of them, and could even change the phrase "green rush" to "green risk."

To learn that the second-highest revenue generator among Tier 2 producer/processors in Washington makes a marginal profit some months, and zero in other months (see the *Guest Interview*, page 32) — and largely the profits are just enough to dump back into the business — along with the fact that many cultivation businesses in Washington are barely staying afloat, is not only disheartening, but should sound an alarm to those looking to launch cultivation businesses and to states working on regulations surrounding newly legal (or soon-to-be-legal) markets.

Regulations can change direction faster than the wind, and business owners can be ... well ... completely screwed. As Avitas Agriculture's Adam Smith explains in the Guest Interview, state regulations and local zoning regulations changed, shattering his business's plans to expand with a greenhouse build-out. Random zoning shifts not only can dismantle a business's development plans, but also can threaten to shutter thriving businesses (think: Pueblo, Colo.). Cannabis businesses contribute millions of dollars in tax revenues to states and municipalities, and create tens and tens of thousands of jobs (more than 20,000 jobs were created in Colorado alone, based solely on licensed businesses and their employees, and not considering ancillary businesses — per the Colorado Dept. of Revenue), and yet can be voted out of existence.

If we could speak to legislators and marijuana control boards that are and will be developing regulations, we would say that if they want to create a viable marketplace and help business owners thrive (and continue to generate major tax revenue), they need to work hand-in-hand with these businesses to ensure the regulations serve everyone.

We've said before how important it is for cannabis businesses to be involved in regulatory planning meetings. More than ever, this seems imperative. Also, joining groups like the Cannabis Farmers Council (Washington), California Growers Association and Cannabis Commission (see the *Guest Interview*) can give cannabis businesses a stronger, collective voice.

While notions of a "Green Rush Fallacy" are not uplifting, it can be affirming to hear reality vs. the media hype we hear so often. All this said, some businesses *are* thriving. And lessons to be learned lurk around every corner. In this issue's Cover Story, for example (page 44), in my opinion, Scott Reach shares insights that should be heeded by every cannabis cultivation business. It is not helpful to operate in a vacuum. Read, and talk to your fellow business owners and cultivators. You are part of one of the fastest-growing, craziest, most exciting and challenging industries ever to exist. Don't go it alone. ✨



PHOTO BY JOE SKODZINSKI

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# CONTRIBUTORS

**Within the pages** of this issue, you will find insights, tips, words of wisdom and even personal tales from some of the brightest minds in the industry and some of the best journalists around. We're pleased to introduce you to our contributors.



**Nic Easley** is the founder and CEO of Comprehensive Cannabis Consulting (3C). Easley, a U.S. Air Force veteran, and 3C have helped more than 60 clients start up, design, build and optimize their commercial cannabis operations. Easley's scientific background, combined with over 15 years of agricultural field and biological experience, offers the industry new possibilities of productivity, profitability and professionalism. **Adam Koh** is the chief cultivation officer for Comprehensive Cannabis Consulting (3C). Previously, he served as cultivation manager of a Denver-area medical cannabis facility that was awarded the *High Times* Cannabis Cup for Best Medical Hybrid in Denver in 2014. Koh has experience cultivating more than 100 different strains, including high-CBD varieties, and in his previous position oversaw the care of roughly 3,000 plants.

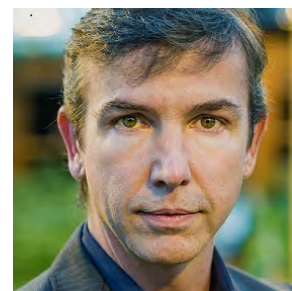
**Kerrie and Kurt Badertscher** are co-owners of Otoké Horticulture, LLC and authors of "Cannabis for Capitalists." They have worked with large-scale cannabis producers for more than 5 years. Kerrie has been involved with plants her entire lifetime and earned certification as a Professional Horticulturist by the 100-year-old American Society for Horticulture Sciences. Kurt brings his 34 years of corporate experience and operations management skills to bear on the business challenges of cannabis cultivation.



**Susy Wilson** is co-owner and operator of W.O.W. Weed, a Tier 2 producer/processor in the central Columbia Gorge. W.O.W. Weed was one of the first 10 licensed i502 businesses in the Washington recreational market. Wilson operates the company with her business partner, Hayden Woodard, and the help of her daughters Sophy and Rachael, along with four full-time employees. W.O.W. Weed grows both indoors and outdoors in soil, with over 160 strains in cultivation.



**Scott Lowry** is a licensed medical grower and caregiver residing in Michigan, and has focused on organic cannabis cultivation for 8 years. He also is founder and COO of a large-scale Canadian cannabis production company in Tecumseh, Ontario, Canada, called Global Organiks Engineering, which is in the application process to become a Licensed Producer under Canada's Medical Marijuana Program.



**David Bonvillain** owns and runs Elite Cannabis Enterprises and Elite Botanicals out of their center of operations in Loveland, Colo. The businesses include a 25-acre organic CBD farm leveraging a low/no-till permaculture methodology, a 6-acre greenhouse property and botanical-extraction laboratory that operates year-round, producing organic CBD for national and international markets through Mary's Medicinals, Mary's Nutritionals and Mary's Pets. He is a speaker, author, consultant and *High Times'* Cannabis Cup winner.



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**Mario Ceretto** is the founder of New Era CPAs, LLP, and has been helping clients in the cannabis industry with litigation support, compliance, 280E strategy, and tax preparation for over six years. He has spoken at numerous cannabis and accounting events. Ceretto holds CPA certificates from the states of Oregon and California.



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**Kenneth Morrow** has been writing cannabis-related articles and books for more than 20 years. He owns Trichome Technologies, a cannabis R&D company. Morrow also is an award-winning grower and breeder. Has made contributions to many of today's extraction methodologies and holds multiple patents. He consults on all cannabis-related subjects. Find him on Facebook at: Trichome Technologies or Instagram: TrichomeTechnologies.



**Steven Nelson** covers legal affairs and drug policy for *U.S. News & World Report*. He lives in Washington, D.C., where a green thumb would be useful.



**Jonathan Katz** is a freelance writer based in the Cleveland, Ohio, area.

top story



## Allen St. Pierre Tenders Resignation

NORML announced Executive Director Allen St. Pierre had tendered his resignation. His last day as the head of the national lobbying organization was July 15. St. Pierre had been the executive director since 2005.

other news



### Smoke Over Troubled Waters

Hawaii's recently rolled-out dispensary program presents a set of problems unlike other states', at risk of leaving patients and dispensaries without medication, thanks to its island geography [surrounded by federal waters].



### Colorado Medical Testing Requirements Start July 1

New medical marijuana testing regulations - which match current requirements for retail marijuana - went into effect July 1 in Colorado. The rules include medical marijuana, concentrates and medical marijuana-infused products.



### California to Vote On Legalizing Recreational Marijuana

The Adult Use of Marijuana Act (AUMA) officially qualified for the Nov. 8, 2016, ballot in California, according to a June 28 announcement by Secretary of State Alex Padilla.



Join the industry conversation and follow us on Twitter. **Noelle Skodzinski**, editor, tweets [@EditorCBT](#); **Kyle Brown**, managing editor, is [@KyleBrownCBT](#); and **Brian MacIver**, associate editor, is [@theBrianMacIver](#).



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# LED GROW LIGHTS

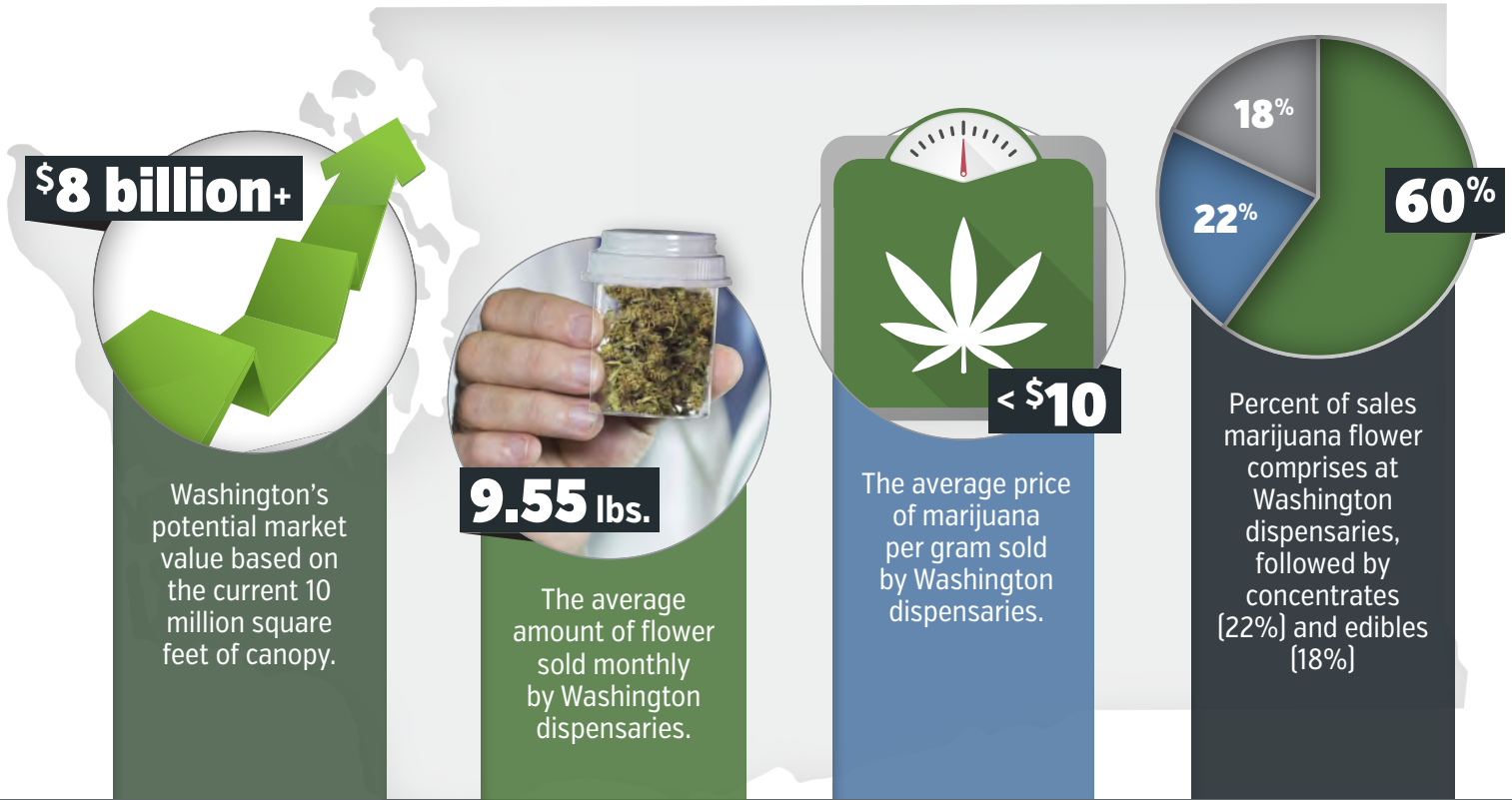
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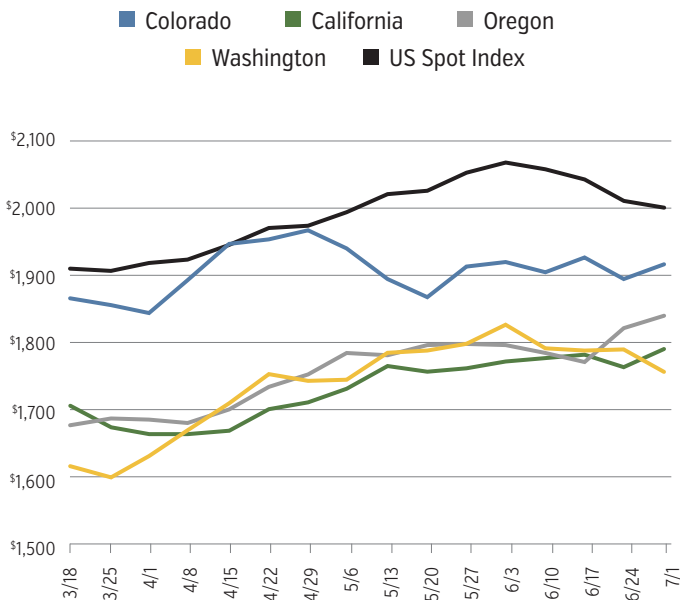




Source: A University of Washington study conducted by UW's Cannabis Law and Policy Project for the Washington Liquor and Cannabis Board.

**Cannabis Benchmarks® State Level Spot Pricing**

Trailing 4-Week Average \$/pound - Week Ending Jul 01, 2016

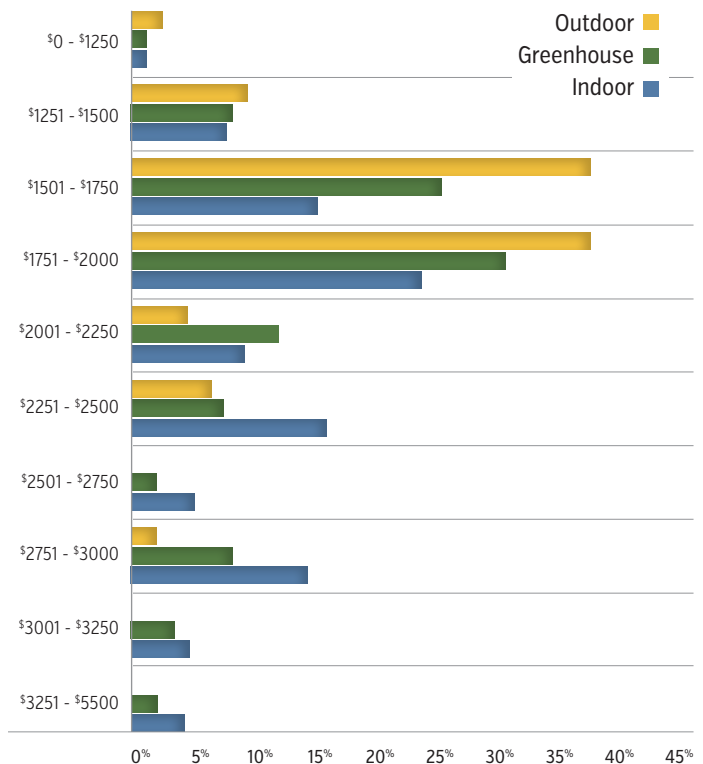


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# GROWTH AND OPPORTUNITY IN CONCENTRATES



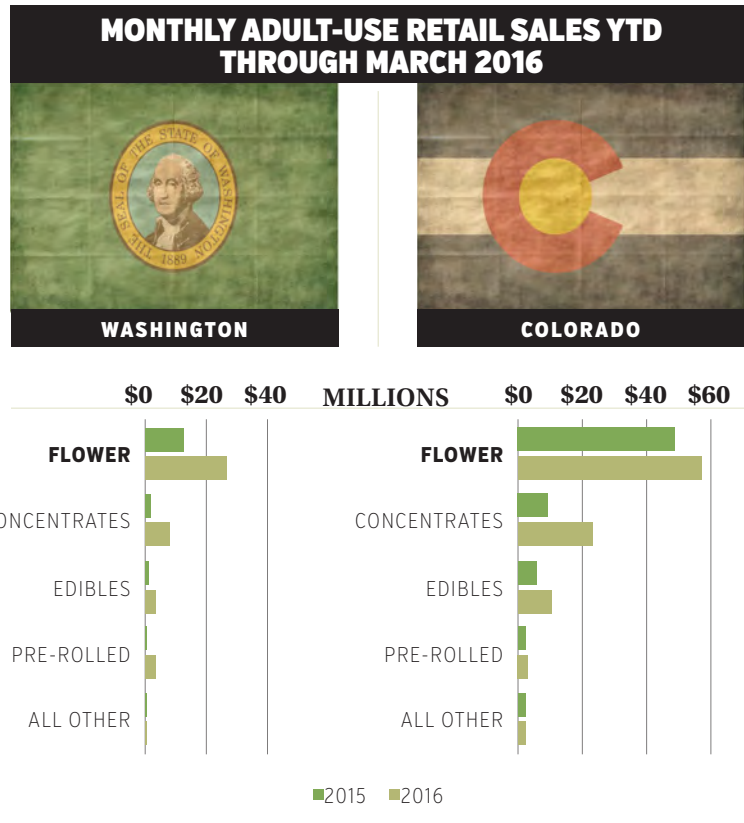
Data sourced from GreenEdge™, BDS Analytics' proprietary data mining tool.

Year-to-date through May, Colorado's cannabis industry is up 36 percent in retail revenue, averaging \$97 million per month, according to BDS Analytics, a Boulder-based firm that tracks retail cannabis sales by brand, item and category. Washington state, for which detailed data is available through March, is up 153 percent in the first quarter. In both states, all categories are growing, but no major category exceeds concentrates' growth, with sales more than doubling in Colorado and quadrupling in Washington over the same respective time periods one year earlier.

Colorado adult-use and medical dispensaries sold \$22 million worth of concentrates

per month through May this year, while Washington's adult-use shops tallied \$8 million per month through March. [Data is not yet available for Washington's medical market.]

The most popular subcategories vary across the states. Shatter is the No. 1 subcategory in Colorado, with \$5.7 million in sales per month (adult-use and medical combined) and growth of 90 percent over the same period last year, while Washington's top subcategory spot goes to prefilled cartridges with \$3 million per month (adult-use only) this year on 364-percent growth. But shatter, prefills and wax occupy the top three subcategory positions in both states.



For a meaningful comparison to Washington data, especially with respect to pricing, we can eliminate Colorado medical sales of concentrates and focus on adult use. Colorado still has larger volume, with \$12 million in total concentrates sold per month in the adult-use market, compared to Washington's \$8 million. Colorado's shatter and wax prices per gram were about 22 percent greater than Washington's. But in prefilled cartridges, for which prices are calculated per unit sold rather than per gram of cannabis, Washington's unit price averaged \$58.30, which is 27 percent higher than Colorado's \$45.74 per unit.

TOP CONCENTRATE RETAIL SALES AND PRICING, ADULT-USE ONLY				
	WASHINGTON		COLORADO	
	Sales YTD per month	Price per gram*	Sales YTD per month	Price per gram*
<b>PREFILLED*</b>	\$3.1 M	\$58.30	\$3.6 M	\$45.74
<b>SHATTER</b>	\$0.7 M	\$25.14	\$2.9 M	\$30.57
<b>WAX</b>	\$1.4 M	\$23.53	\$2.7 M	\$28.85

\*Price for prefilled is per unit not per gram

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# PACKAGING FOR PROFIT

A close-up look at what cannabis consumers want to see on marijuana products' labels and packaging.

By William Honaker and Bethany Gomez

Packaging creates the first impression consumers have of a product.

Brightfield Group surveyed more than 500 medical patients and adult consumers in recreational states about what they want to see in edibles packaging; the results can help make your products more appealing.

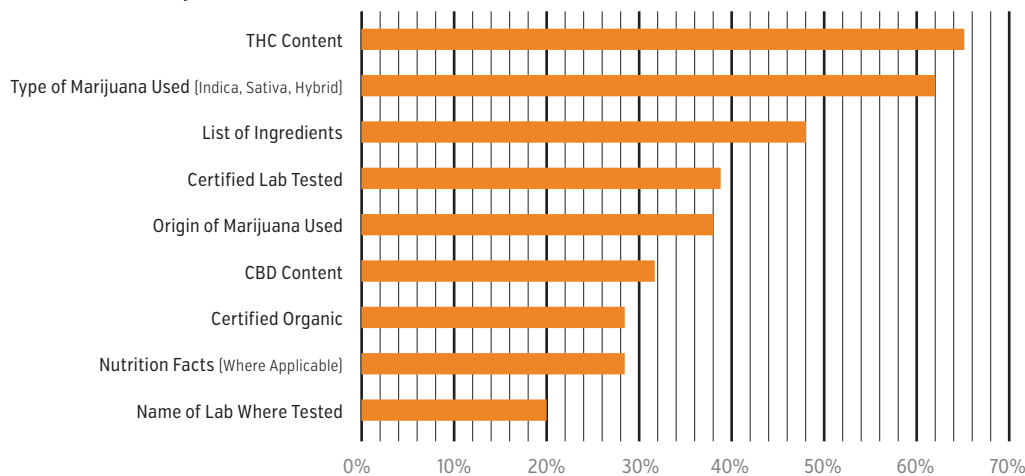
A strong majority of participants in Brightfield's research indicated they prefer clearly labeled products regarding a number of key characteristics: **more than 60 percent of consumers indicated a preference for labels outlining a product's THC content and strain type (indica, sativa, hybrid), while almost 50 percent expressed a desire for a list of ingredients.**

Many respondents also said they would like to see more products labeled with organic certification or nutritional information, reflecting the large number of health-conscious consumers in the market. *(Editor's note: While there are similar industry certifications, no product containing cannabis can be certified "organic" since the FDA, a federal organization, regulates the term's use.)*

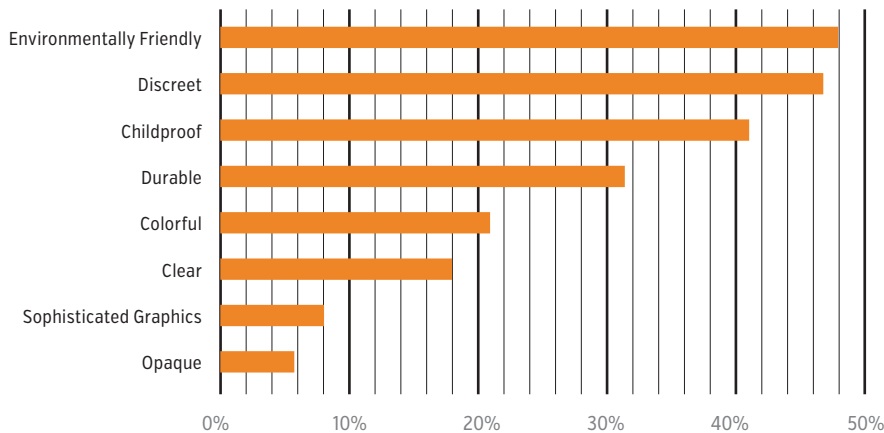
Discreet packaging, which can enable public consumption, was important for more than 45 percent of respondents.

More than 40 percent said they prefer childproof packaging, while 30 percent wanted

## WHAT KIND OF LABELING WOULD YOU LIKE TO SEE ON YOUR MARIJUANA PACKAGING?



## WHAT KIND OF MARIJUANA PACKAGING APPEALS TO YOU?



durable packaging for storage and freshness.

The largest percentage, nearly half of those surveyed, said that environmentally friendly packaging was important.

Cannabis consumers are becoming more sophisticated and are developing loyalty to manufacturers they can trust. Creating a branded and informative package is a component of building that trust. ✨

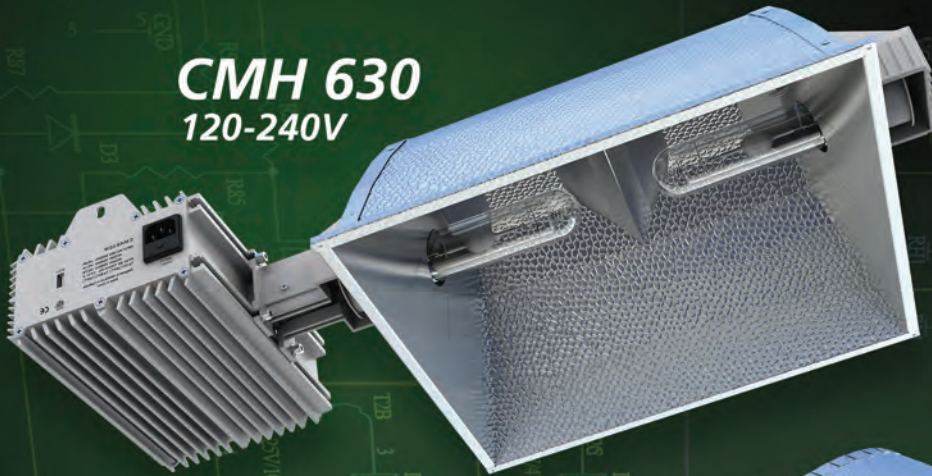
**About the Authors:** William Honaker is an analyst with the Brightfield Group, a research and analytics company that studies consumption patterns, demand trends and state and local regulatory developments in the legal cannabis industry. Bethany Gomez is director of research at Brightfield Group.



# NANOLUX

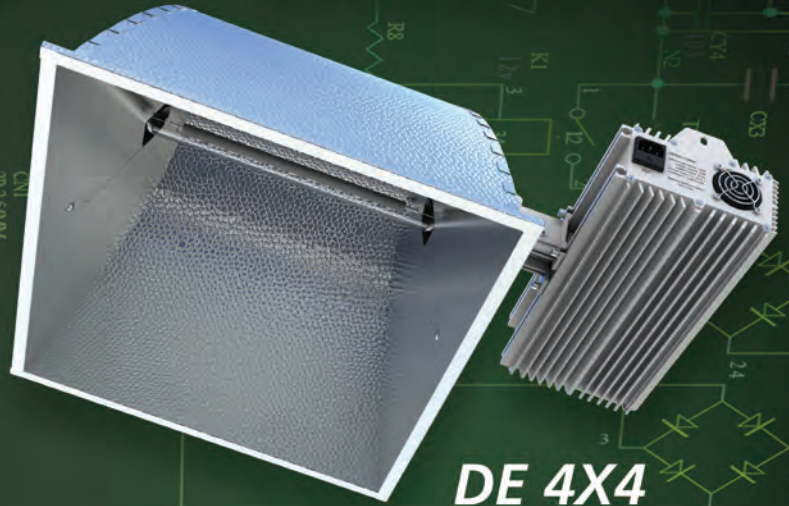
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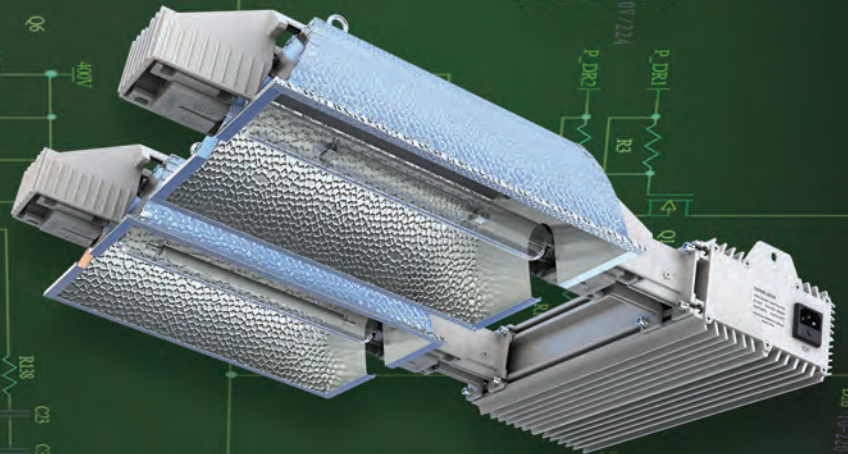
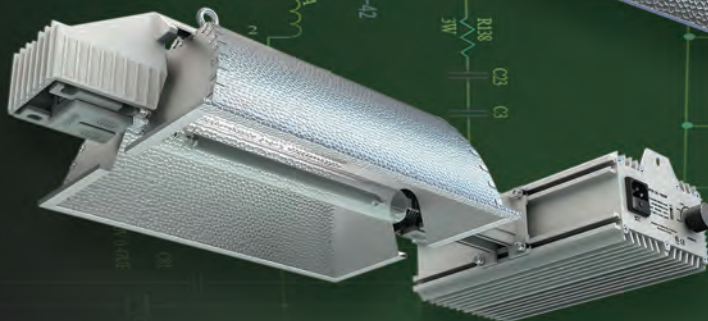
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# 10 QUESTIONS WITH

## ANTHONY BRACH AND KELSEY COHEN

How the **District 8 cultivation team** built a grow around sustainability and local suppliers.

By Kyle Brown

**ANTHONY BRACH AND KELSEY COHEN** joined the District 8 team last year as cultivation operation leads when two of the owners called them in for an interview at the recreational grow in DeBeque, Colo.

They built it from the ground up, designing a cannabis cultivation operation that was locally sourced and environmentally responsible to raise “naturally grown cannabis,” says Cohen.

*Cannabis Business Times’* Managing Editor Kyle Brown talked with Brach and Cohen about how they planned the grows (30,000 square feet between a greenhouse and warehouse), and what it means to be aware of environment and community in the industry.

### **Kyle Brown: What were your first steps in getting the grow started?**

**ANTHONY BRACH:** It takes a strong group of diverse individuals with many different backgrounds. It has been a mix of people with ... backgrounds in marketing and mergers and acquisitions and accounting. Even one of our guys is a compliance guy that trained in the medical scene. ... So Kelsey and I are ... only responsible for the cultivation practices. It is a very compartmentalized group ... and everybody is responsible for their own little piece of the puzzle.



We've seen where business owners ... think they can do it all. It really just doesn't work that way because no one can do everything. You have to focus on ... your strengths ... and realize what your weaknesses are. ... Then hire or partner with people who are capable of doing things you aren't.

**Brown: How did you pull the team together?**

**BRACH:** That's the crazy thing. Last summer when I was approached, they basically said, "We've got the whole team together, except for a grow team." Finding ... [people with] business management skills and marketing people, I mean, all of those jobs exist [from other industries]. But when it comes down to the basis of a cultivation site, you have to find ... people ... [who are] able to talk business with business owners and also ... able to grow [the] plant.

**Brown: How did you plan the specs for the grow?**

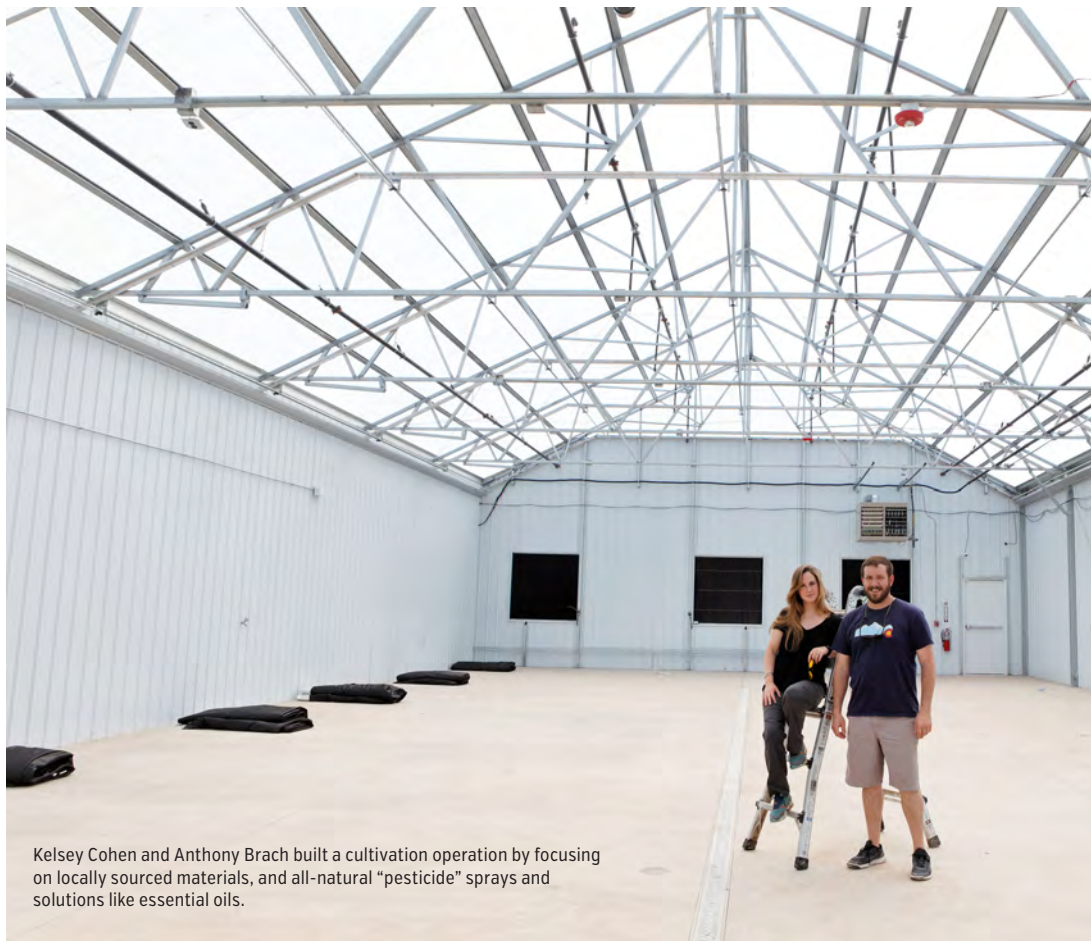
**KELSEY COHEN:** We learned a lot from old jobs and past experiences. We had just been ... growing a list of ... what would be helpful, what would be a dream to have and everything that would possibly be of a necessity to get this off the ground.

**Brown: Did you actually make lists? What were the top items on those lists?**

**COHEN:** Yeah, we did. [laughs] We didn't know what it would entail for our budget with all of our wants. We also had to be realistic.

[At the top of the necessary list were] concrete floors for the greenhouse. We are very nervous with pests and disease ... so we think concrete, avoiding having a dirty floor, would help mitigate that. Environmental controls were also high up there.

[For the dream list,] I would love to have an ATP assay tool. It's a tool where you can swipe any surface, and it measures the ATP and the bacteria giving it off, so you know if your surface is contaminated or not. It's actually a standard regulation in Canada.



Kelsey Cohen and Anthony Brach built a cultivation operation by focusing on locally sourced materials, and all-natural "pesticide" sprays and solutions like essential oils.

**Brown: What does it mean for you to be locally sourced?**

**BRACH:** We try to source everything ... first and foremost locally, which is the Western Slope. Then we [try to source within] Colorado, then we go to the western region of the United States. The ... North America, then Central and South America. Then we start looking at seaport importation.

I would say 95 percent of the stuff we have bought is from North America.

**COHEN:** It is just a matter of being responsible and wanting to have a very low carbon footprint and be sustainable. ...

Also, it pays ... to have things locally, even if we have to pay a little bit more; if something were to break or happen, [the company] is right there.

**BRACH:** You can buy fabric pots by the million and import [them] from China.

But we paid for them to come from South Carolina, and manufactured in New Mexico. We paid an extra 50 cents per pot — times thousands of pots. But that is less carbon footprint on shipping, and ... we are able to map out our sustainability ... and be responsible to the consumer. We are touting our sustainability and environmental stewardship.

**Brown: What does "naturally grown cannabis" mean for you?**

**COHEN:** No synthetic nutrients or pesticides. The term "pesticide" is actually really broad. ... We just use no synthetically based spray or pesticides. I would even like to use the word "organic," but you're not allowed to in this industry because it is a federal [U.S. Department of Agriculture] term. [But] ... we are going for top-grade ingredients for consumers. We are putting in all-natural ingredients and trying to emulate Mother Nature. ... We



are really trying to bring a higher standard.

**BRACH:** Like [Kelsey] said, “pesticide” can be a pretty broad term. A pesticide is anything to combat or negate a pest or disease. That can be something as small as wiping tabletops down with a bleach solution or spraying a non-toxic type of essential oil on your plants to protect them. ... That is emulating Mother Nature. ...

So, in early plant processes, we spray a low dose of essential oils, which can be anything from rosemary to cinnamon, among others. The e ... occur in [nature] and are simply concentrated [into oils]. Then e put them into a spray and they basically bug the bugs, and the bugs

don’t want to be on that plant.

It is a look at problems with prevention instead of solutions. They say “an ounce of prevention,” and it’s completely true in this regard. It’s just a matter of: Do you have the foresight to know what the potential problems are, and are you willing to spend the money up front to not have those problems?

### **Brown: How do you sell your investors on this?**

**BRACH:** The group was lucky enough to have a single-point investor (completely privatized financial backing) — a completely silent partner who, lucky for us, was raised here over on the Western Slope and had a family that has been in agriculture before. He ... actually had a pretty basic understanding of agriculture and how hard the work is, and what is involved.

[The selling] was more on the lines of coming to the group and saying, “Here are

all the preventative measures we can take, and this is how much it costs. Or here are all the reactionary methods and what they cost. But, the difference is that if we do the preventative measures, we don’t have to worry about a negative potential impact on our end product. Whereas, if we react to all of our problems, we are going to be squirming around, taking hits on our end product, taking hits on quality, putting way more labor and money into it.

### **Brown: What’s a hurdle that caught you off guard in putting the grow together?**

**COHEN:** One of our main hurdles was the smell. People think that they will get high off the smell, whatever our building gives off — which is obviously not true. So, finding a cost-efficient and effective smell mitigation was a challenge, especially to fit in with all of our ideals.

**BRACH:** We found a solution, but it’s one of our proprietary solutions, and we are not at liberty to discuss what technology we use.

[A] major hurdle that no one has any control over, especially in Colorado, in the building process, is how adverse weather can affect your timeline for construction.

One of the [other] problems we have is the manufacturing end, and production of our greenhouse facility via [the company we hired], because they’re used to building a couple greenhouses a year. ... Then boom, the cannabis industry hits, and they are under full demand, and they have not had a chance to increase their production warehouses and shipping routes.

So when they go to manufacture a specialized, high-tech greenhouse, it takes a lot of effort. And then they have dates that don’t necessarily line up. If you have a good project manager, he has a chart of when everything needs to arrive and ... get done. ...

One or two days or even a week of a screwed-up timeline from a supplier can really throw a wrench into your system.

### **Brown: What’s important that you do right from the very start of your grow?**

**COHEN:** To get started, you have to buy a

clone from another grow. I found that to be worrisome because I don’t know the practices of that grower. I don’t know if they are being transparent with me, but I am relying on them to give me all of the genetics that we’re going to be using for our greenhouses.

So I could be bringing an infection or insects into this facility that we just invested a lot in. So, being on top of our game when those clones come in so we can mitigate any problems is a top priority.

We toured a lot of grows to try to decide where we were going to buy the clones. Some were great, some weren’t great.

One more thing that is pretty important to get right from the beginning ... is the people we hire. I feel they make or break you. ... Those are the people who are in the trenches from day to day. People need to be mindful of compliance. They need to be on the same page, and they have to have the same care and pride in their job that you do, and you have to trust them, ultimately.

### **Brown: How do you choose your employees?**

**BRACH:** Luckily, we have made some friends in the industry, and you can recruit via contacts and references in certain regions. ... When we [create] a job posting, we define the people [and requirements] we are really looking for. ...

Then it just comes down to: Are you willing to put in the hard work? This kind of ties back to what people should know when they’re starting a grow. A grow site is not a manufacturing practice. It is not an industrial complex. It is an agricultural-based business. You are growing plants ... and it is 24/7, 365 [days a year]. You don’t get the winters off like the farmers. You don’t get to take a break — the plants don’t. You have to be present all the time, and you have to care. The people really have to have a vested interest in your business.

Part of that is paying people correctly, giving people incentives to stay motivated and treating your people right. Those are the people who are building a business for you. You can’t mistreat them and not pay them correctly. ✱

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## ARE YOU READY FOR THE NEW OVERTIME RULE?

Details behind the higher salary threshold, how it will impact cannabis businesses and what you need to do to prepare for it.

By Noelle Skodzinski

**P**resident Obama and Secretary of Labor Tom Perez announced May 18 a rule change regarding overtime regulations, which will impact not only more than 4 million workers, but also businesses of

all sizes across the country — including cannabis businesses. The department of Labor's (DOL) final rule raised the salary at which workers would be eligible for overtime from \$455/week to \$913 (from \$23,660 to \$47,476 per year).

This means that any employees who make \$47,476 or less per year (with some exceptions; more on this below) must be paid overtime (1.5 times the employee's "regular" rate) for any hours worked beyond 40 hours per week.

The final rule becomes effective Dec. 1. "This long-awaited update ... will go a long way toward realizing President Obama's commitment to ensuring every worker is compensated fairly for their hard work," explains

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the U.S. DOL's Wage and Hour Division on its website.

"The reason they put this into place is to protect people who are making, say, \$35,000 a year and working 70 hours a week," explains Kara Bradford, chief talent officer for cannabis staffing and recruiting agency Viridian Staffing.

Bradford says that the overtime threshold applies whether workers are salaried or hourly.

"This change affects all businesses and certainly will impact cannabis businesses," says Mark Slaugh, executive director of the Cannabis Business Alliance. "The salary range now eligible for overtime extends to many entry-level and management positions in the industry."

"[The exemption] will be an impact, especially for retailers that are not vertically integrated, so they are non-agriculture," Bradford explains. "In certain states, for agricultural businesses, you don't have to pay overtime. In other states, if anyone works more than 8 hours per day, you have to pay overtime," she explains.

It's important to check with your Human Resources executive or department, she suggests. For those businesses with no HR department, check your business classification and overtime laws with your state DOL or the organization that handles labor regulations in your state.

Because so many businesses in this industry are startups, and compliance with state/industry regulations consumes so much of a business's attention, Bradford says, "I don't think people are thinking about this that much."

They should be, however, especially since many startups can't afford to pay the highest

wages, and grow teams are often required to work overtime, especially during harvest.

"Every business will need to look at whether they need to pay overtime, and in most cases, they will have to," she says.

Slaugh says cannabis businesses will be harder hit by the new rule than other businesses. "The unique factor for the cannabis industry is the IRS 280E tax code, which unfairly collects tax from cannabis operations, without allowing for the same write-offs that other businesses receive, because of marijuana's federal status. 280E effectively overtaxes the cannabis industry and pushes around 50 percent to 70 percent of industry profits into Federal coffers," he says.

"Overall, the cannabis industry does not mind worker protections and complying with all laws allowing us to operate freely," he adds. "However, the Federal Government needs to increasingly consider our industry when making policy changes that impact all businesses. Ideally, the Federal hypocrisy in expecting an industry they deem illegal to follow all business regulations without the same equality afforded to other businesses should come to an end as soon as possible."

**Who Is Exempt?**

Under the DOL's Fair Labor Standards Act (FLSA) guidelines, "white-collar" employees who meet certain requirements are "exempt" from overtime (and minimum wage), says Alex Wheatley, an attorney at labor and employment law firm Fisher & Phillips LLP. "Generally speaking, to be exempt ... the employee must satisfy both a 'duties test' and

a 'salary test.' Under the duties test, the employee must perform executive, administrative or professional duties," explains Wheatley, "and each of those categories have their own requirements."

The duties test did not change with the new overtime rule, he says. However, the salary test did.

"Many employers will find that employees they previously paid between \$23,660 and \$47,476 per year do meet the duties test, and they now have to either increase that employee's salary to pass the salary test or convert that employee to a non-exempt employee and pay overtime," Wheatley says.

He stresses that while the duties test did not change, the new overtime rule should "serve as a reminder to all employers to make sure that the employees they are treating as exempt do pass the duties test. Even if you pay someone \$90,000, if they do not meet the duties test, the employer must pay overtime," Wheatley says.

The exemption is another exemption, he notes, for "highly compensated employees" who make more than \$134,000 per year (which is an increase also imposed by these new regulations, up from \$100,000).



Kara Bradford



Alex Wheatley



Mark Slaugh

**What Should Cannabis Business Owners Do?**

"All employers will now have to consider adjusting base pay for employees in comparison to the hours those employees work and whether the marginal cost of overtime is more or less than the marginal cost of increasing or decreasing base salaries for these employees," Slaugh says.

Tom Regan, president of cannabis cultivator and retailer Mindful Colorado, is in the middle of that process.

"We are currently about halfway through converting our qualifying

employees," Regan says, "and we have found that the key is to take this mandatory action with sensitivity and understanding for our employees and their individual roles."

"It is important to remember that employers can forbid employees from working overtime without authorization and can even fine employees if they work overtime without authorization," Slaugh adds. "Though, if the employee works any such overtime hours, the employer must pay the overtime premium even though the employer is fining the employee." ✪



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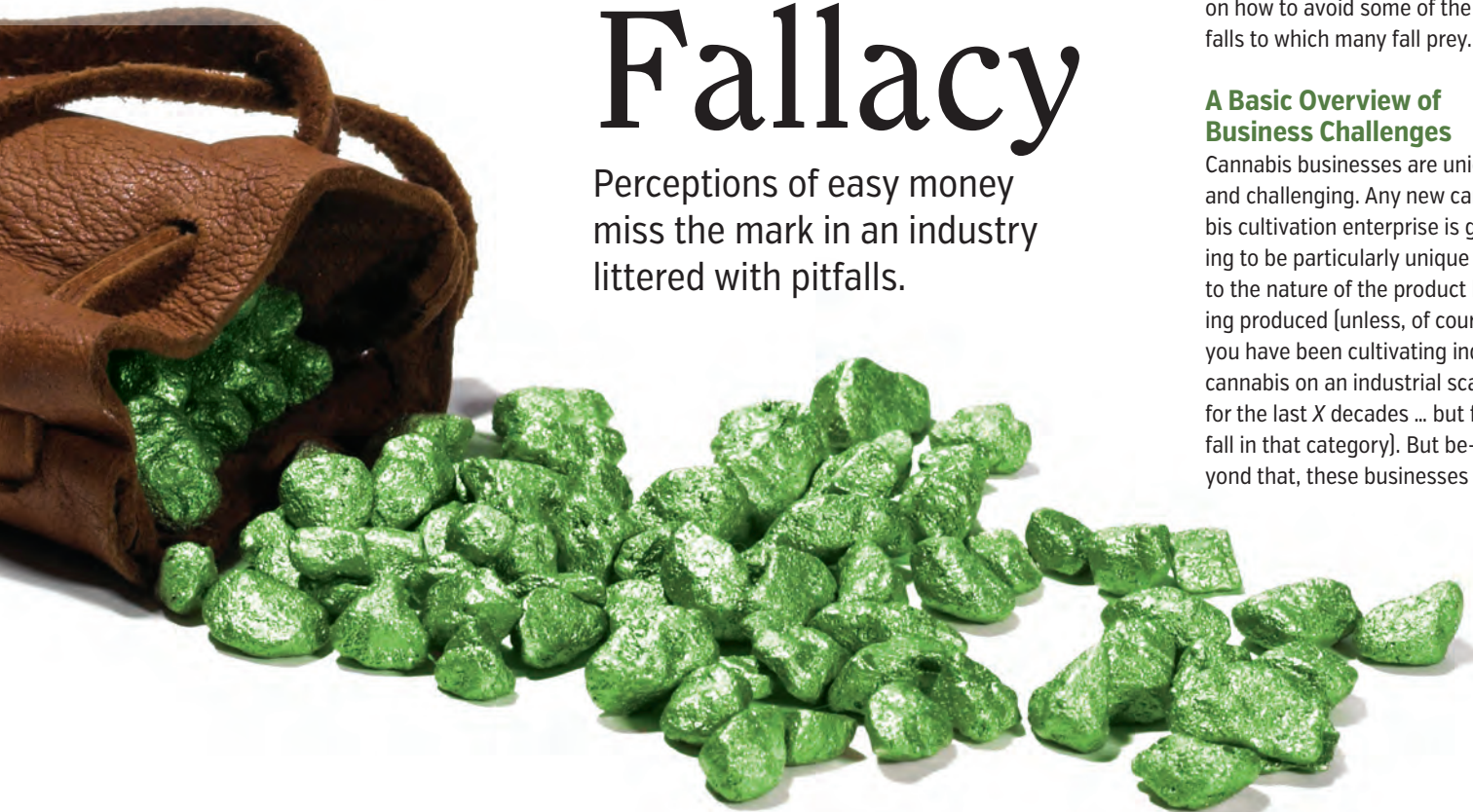
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# The GREEN RUSH Fallacy

Perceptions of easy money miss the mark in an industry littered with pitfalls.



New states continue to come online with medical cannabis programs. As a by-product, teams of potential and current cannabis entrepreneurs flock to each location to secure licenses. Is the new state-by-state cannabis licensing game a true gold rush? Is it even profitable?

Currently Washington, Colorado and California receive much of the attention pertaining to the cannabis market. This article, however, will focus attention on many of the new states with medical cannabis programs that are either in their infancies or still in licensing phases. Looking at the challenges and potential benefits of being in these emerging, but more restrictive markets, should provide a more realistic view of the business landscape and provide guidance on how to avoid some of the pitfalls to which many fall prey.

## A Basic Overview of Business Challenges

Cannabis businesses are unique and challenging. Any new cannabis cultivation enterprise is going to be particularly unique due to the nature of the product being produced (unless, of course, you have been cultivating indoor cannabis on an industrial scale for the last X decades ... but few fall in that category). But beyond that, these businesses also

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are challenged with a variety of hurdles that “normal” businesses simply do not have to accommodate for: limited banking/no financing, few insurance providers, obscene tax implications, no interstate commerce, evolving controls, prohibitive legislative changes and vendors hesitant to engage the industry.

### New (Restrictive) Markets

New states with legal cannabis programs present their own unique challenges as the various regulatory bodies (both state and county) implement their own legislation and ever-evolving regulatory controls. Many states build untenable barriers to entry and/

or executing business in any type of profitable manner, or implement barriers to patients' ability to qualify and register to legally purchase the products.

States intent on implementing successful programs frequently limit the number of licenses available and utilize a competitive application process through public posting of a Request for Application (RFA). Applicants have a limited time to document their ability to meet or exceed the controls defined by the state in the RFA.

The application process frequently costs the applicants tens of thousands in cash outlay (usually nonrefundable) to the state simply to submit the application, and third-party expertise to consult and prepare the necessary documentation can easily double and quadruple those costs.

Before chasing after a license in a newly legislated cannabis program, consider some of the unique requirements of the programs being implemented. Every new state's cannabis program borrows from a previous state's controls and regulations, while adding its own unique circumstances or culture. Therefore, controls and requirements vary widely from state to state. The list below gives an overview of some of the unique mosaic of state controls:

- **Cannabinoid Restrictions**

While many states have full spectrum (THC, CBD, flowers, concentrates, etc.) medical cannabis programs in place, others restrict all products to specific non-psychoactive cannabinoids – primarily CBD. Some states, like Virginia, also theoretically allow THCA (tetrahydrocannabinolic acid); you can't purchase it, cultivate or produce it, but you won't go to jail if caught with it – provided you have intractable epilepsy.

Restrictions within these limited-cannabinoid programs require producers (if production is allowed) to keep THC concentrations below certain thresholds – in some cases as low as what is recognized federally as ‘hemp’ – while also requiring costly environmental and security controls similar to those used for cultivating THC-rich cannabis. At best, this scenario makes the costs of good sold (COGS) equal to

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that of a high-THC product, while having less revenue potential. That is, if the business can survive at all in such a climate.

- **Production and Manufacturing Requirements**

Between restrictions on locations, a myriad of environmental controls are relevant for any new operation. State legislators expect advanced security controls to be in place and, as such, most allow indoor cultivation only, which has a significantly higher build-out cost associated with it, as well as significantly higher ongoing costs (as compared to greenhouse or outdoor cultivation).

Many states also restrict the product types that can be produced and sold – such as, in New York, the lack of botanical inflorescence and largely restricting the market to concentrated cannabis extracts, or, in Maryland, the restriction against all edibles. Obtaining a license is just the starting line.

- **Approved Medical Conditions**

The medical conditions the state approves is one of the most important factors for new businesses in an immature medical cannabis market. Those conditions and a patient's ability to become registered to purchase the product dictate the number of potential customers for a new business entity. In states with very restrictive conditions, the market potential is very limited. Following potentially several million dollars in start-up expenses, many organizations find that the limited patient base is inadequate to support their bottom line.

- **Vertical Integration**

States such as Colorado have wavered back and forth between requiring separate manufacturing and distribution models and vertical integration to a point where the current market is a blend of both. Most Eastern states have leveraged a distributed model in which producers are separate entities from retailers, and the number of producers/manufacturers is significantly limited; for example: four in Connecticut, five in New York, 22 in Illinois,

five in Florida, 15 planned for Maryland.

- **Limited Marketing**

While regulations may vary by state or locale, marketing is controlled tightly in nearly all markets. Once/if state or regional challenges are overcome, outside

of a handful of print publications and social media, there are few national advertising or marketing options available to any cannabis enterprise.

- **Limited Expansion**

Frequently, very restrictive controls exist

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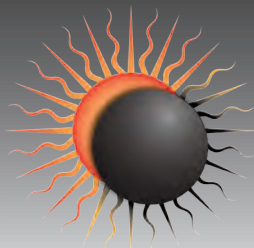
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with regards to canopy size and product scope. Once facilities are identified and secured, licenses are obtained, and the business is in production and the market matures, if you want to expand or move, a variety of unforeseen challenges both from the regulators and local communities [for example, new licenses required, zoning regulations, and limits, again, on size] can develop.

#### • Buy-In and Production Costs

While not all states are relevant for these issues, in many states [e.g., Connecticut, Illinois, Florida, Maryland] potential applicants must have several million dollars in liquid assets to even participate in the qualification process. Additionally, components such as build-out costs, personnel, security, power and ongoing compliance increase COGS exponentially. When you consider competition from not only other licensed businesses, but also the black market, you can quickly see that exceedingly high COGS can cause a serious issue for a return on investment and profitability.

#### • Nonprofit vs. For-Profit

Several states [e.g., California, New Mexico, etc.] also have a requirement that any licensed cannabis entity be a non-profit.

Despite the many challenges associated with these competitive licensing processes, each state's application-submission process is deluged with thousands of applicants – by both local entities, as well as out-of-state interests [where permitted]. These teams rush to engage consulting services from a variety of experts [such as attorneys, compliance resources and architects] and would-be experts [everyone and his brother suddenly is an expert offering consulting advice to those who know even less], and frequently acquire properties well in advance of the RFA release.

#### Easy Money

A persistent mentality around the industry is that cannabis equals easy money. There is, however, no replacement for comprehen-

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sive business planning and efficient operations. If your current business plan resembles: "get license -> grow lots of weed -> make lots of money," then perhaps the drawing board should be revisited.

The thought that you can take a mediocre business model and make it thrive in a new market simply because a competitive license was obtained is a fallacy.

I have witnessed organizations that are B and C players in a mature and relatively free(er) market environment clamor for licenses in a new state as if it is the best business idea they have ever had. It is important to remember that even if mediocrity can shine temporarily in a restrictive and monopolized environment, it is a big fish in a small pond scenario, artificially created by the regulatory controls in place. Mediocrity is simply mediocre and will not survive in a competi-

tive environment.

The longer-term business climates in which many restrictive regulatory controls are eased and the competitive state landscapes become more robust will see premium quality, comprehensive product sets, competitive pricing and efficient operations win the day.

While there is no doubt that the product in question benefits (currently) from artificially high market prices, that is largely due to the prohibition implemented by the government vs. an appropriately profitable model (e.g., earnings vs. cost of goods sold).

If a new organization isn't planning for the longer term and treating the environment like an operational challenge focused on an indoor-cultivated agricultural commodity, there will soon be (unfortunate) surprises around every corner. ✱

**About the Author:** David Bonvillain owns and runs Elite Cannabis Enterprises and Elite Botanicals out of their center of operations in Loveland, Colo. The businesses include a 25-acre organic CBD farm leveraging a low/no-till permaculture methodology, a 6-acre greenhouse property and botanical-extraction laboratory that operates year-round, producing organic CBD for regional, national and international markets through Mary's Medicinals, Mary's Nutritionals, Mary's Pets, IncrEdibles, and Cheeba Chews. He is a speaker, author, consultant and *High Times*' Cannabis Cup winner.



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GUEST INTERVIEW

SUSY WILSON

# TRAILBLAZING THE WASHINGTON CANNABIS MARKET

**W.O.W. Weed's Susy Wilson** interviews **Adam Smith** of one of Washington's first and now leading cultivation businesses, **Avitas Agriculture**.





In 2012, Adam Smith left his high-profile career behind (he had worked as a program manager at Microsoft and senior product manager at Disney before becoming ESPN's vice president of Global Digital Business Operations) and moved to Washington state on the eve of its legalization of recreational marijuana, under Initiative 502. He and Jason Smit, an old friend of Smith's who had spent more than a decade growing medical cannabis, quickly filed all the paperwork with the Secretary of State, and Arlington-based Avitas Agriculture was born.

The next year was spent participating in Liquor and Cannabis Board (LCB) meetings: staying on top of LCB rules, along with Department of Revenue taxation rulings and county zoning laws, says Smith. When the latter didn't quite work out how he hoped (more on this below), Smith opted for a 4,200-square-foot indoor facility under a Tier 2 license for facilities between 2,000 and 10,000 square feet.

After growing his 22-employee operation into one of the state's highest-grossing Tier 2 producer/processors (at press time), Smith, who is the sole owner of Avitas, turned his sights toward Salem, Ore., where his new 12,000-square-foot indoor growing and processing facility is being finalized.

This issue's Guest Interviewer is W.O.W. Weed's founder and lead grower Susy Wilson, who is a co-founder of the Cannabis Farmer's Council, a grassroots, growers advocacy group in Washington, which aims to keep growers involved in the legislative process. Here, Wilson talks with Smith about his path to success, the realities of what success means in the Washington market, things he would have done differently, and much more.

**Susy Wilson:** You're the second-highest Tier 2 revenue generator among producers/processors in Washington, with nearly \$4.5 million in total sales since you started. To what do you attribute this success?

**Adam Smith:** Some planning, a lot of luck and just adapting to market conditions. I think

Adam Smith inside his new 12,000-square-foot cultivation facility in Salem, Ore.

PHOTO: JAKE GRAVBROT

that's ... why we are moderately successful. We've stuck to our core philosophy ... that we were going to be a socially and economically responsible company, and we are going to treat all of our partners and employees fairly.

... At the same time, you look at those topline numbers and they sound huge; wow, \$4 million. But any profit we made has gone right back into the company to help fund our expansion and to help us with efficiency

**Wilson:** Are you seeing any income from this personally?

**Smith:** I pay myself a very modest salary. But other than that, we're in this for the long run.

**Wilson:** What type of growing mediums do use and why did you choose them?

**Smith:** We started with a hybrid organic and hydroponic method that Smit (who is now our head grower) had used for several years.

**About the Interviewer:** Susy Wilson is co-owner/operator of W.O.W. Weed, a Tier 2 producer/processor that was one of the first 10 licensed i502/recreational cultivators in Washington. She operates the company with her business partner, Hayden Woodard, and the help of her daughters, Sophy and Rachael, and four full-time employees. W.O.W. Weed grows both indoors and outdoors in soil, with over 160 strains in cultivation.



Recently, we switched over to an all-organic, living soil-based process. ...

That change to all-organic processes falls in line with our commitment to create a healthier, more sustainable product line ... and offering products that we, as cannabis consumers, would want to consume.

**Wilson:** Do you employ any automation technology in your Washington grow?

**Smith:** Our lights and everything are automated from a timing perspective, and we have an irrigation system in place, and that really decreases the labor needed to hand water all the plants.

**Wilson:** What kind of lighting do you use?

**Smith:** A mixture of fluorescent lighting for cloning and high pressure sodium bulbs for vegging and flowering.

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# MEDIATION FOR THE CANNABIS INDUSTRY

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**Wilson:** How many crops do you cycle or harvest per year?

**Smith:** We do a perpetual harvest, so we are planting every two weeks and harvesting every week, depending on the flowering length of the plants.

**Wilson:** Especially since you grow indoors, have you had any problems with pests or mildew?

**Smith:** That's actually another reason we moved to this living soil growing medium. A lot of these indoor growing issues are brought about because the environment is so dialed-in and within specific constraints, that if it gets out of that constraint, you deal with really bad pest or environment issues.

This living soil technique is really interesting because a lot of those pests live in the soil, and when you have a natural balance of the ecosystem, none of these issues really ever become big issues.

**Wilson:** You source flower from other growers to produce your concentrates. Do you only use other growers' products for those?

**Smith:** We primarily use products from our partner farms, for our CO<sub>2</sub> oil line, and that is because we just don't produce enough flower to maintain that product line. We work with some of the best partners in the state and are very proud to work with them. We do use our own flower for our rosin extracts and for hash and keif, and stuff like that.

**Wilson:** How many different strains do you currently grow, and how many of those are mainstays versus more research and development?

**Smith:** It was funny: When we first started, I had this grand plan about how we were going to have eight strain mainstays ... and four rotating strains that we would have as R&D, or as limited-edition or seasonal strains. But it didn't work out that way

because of market demands.

Some strains we started with were really popular, and some weren't; so we ... started new genetics for different things, and we've gone through pheno-hunting for stabilized genetics of specific strains. It's become a much more fluid situation. But that's just for us to keep searching for new products to keep things fresh and trying to grow the best product we can.

**Wilson:** Do you or your employees track data throughout cultivation? How do you use the data?

**Smith:** I'm kind of a data nerd, so we track everything. And the same thing for Jason [Smit]. His background is actually in aerospace engineering. He was a composite materials engineer prior to being a full-time grower. So we track everything from the climate to yields to outdoor temperatures. ... The same thing goes for all the stuff we process. Whether it's



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## FAST TAKE ... WITH ADAM SMITH

**Biggest challenge launching or maintaining a cultivation operation:**

"Ensuring compliance with regulations – definitely. ... Staying on top of the forever-changing regulations and rules, and trying to plan and adjust based on how those rules are really going to affect our business."

**Favorite aspect of work:**

"I love that it's new, it's dynamic. Every day is different. That's exciting. It's also challenging."

**Things about operating a cultivation facility that**

**most people don't know:**

"It's not very glamorous. It's a lot of hard work. We don't show up in our overalls and smoke weed all day. It's the hardest business I've ever been involved in, and I worked at Microsoft, Disney and ESPN."

**Best business decision he has made so far:**

"Hiring the right people. ... It's always about the people that you put around you to support the business."

**Worst business decision he has made so far:**

"I think we made a lot of

little mistakes along the way. A handful of them are probably: being a little underfunded when we started; being overly optimistic about ... how much the market was actually going to be; and also just not hedging the regulatory risks as well as we probably could have."

**What keeps him awake at night:**

"... The horizon of this industry is so unknown, and it's so hard to figure out what our trajectory's going to be when we can't really see what's over the next hill. This November is

obviously going to be huge with all the states that are up for legalization. That's going to dramatically change the dynamics of this industry one way or the other."

**What helps him sleep at night:**

"At the end of the day, this is fun, right? I mean, it's challenging, it can be stressful, it's a ton of work, but it's fun, and we are part of a new industry, ... part of something that's going to change the world. And that's why we started this company – to help change the world."

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**Wilson:** What have been some lessons you've learned the hard way?

**Smith:** The biggest challenge honestly has been that we made business plans based on things the Liquor Control Board and our local governments told us were going to happen. And those things have been changing ... and have a dramatic impact on the planning we can do.

When we first applied for a license, we were planning on building greenhouses on our front property, and we initially applied for a Tier 3 license. Because we didn't have the facilities built, we were limited to applying for the square footage we had already constructed.

So we applied for and got our Tier 2 license. Now, of course, they are not issuing any new licenses [to existing licensees], and we are stuck at a Tier 2 license [unless we] buy another company or purchase a license.

**Wilson:** And even worse for you were zoning issues. ...

**Smith:** Yeah. When we applied, our zoning allowed for us to build greenhouses. [By the time] we put our permits in to the county so we could start expanding on this property, they said, "We are not accepting any more building permits for marijuana companies because the county is going to vote on a moratorium in November."

And, of course, in November, the county put a temporary moratorium prohibiting any expansions or new marijuana businesses on R-5 [zoned Rural 5-Acre] property. Then in January 2015, they put that moratorium into permanent effect. So we got double screwed.

**Wilson:** What have been some unexpected costs during your build out and launch?

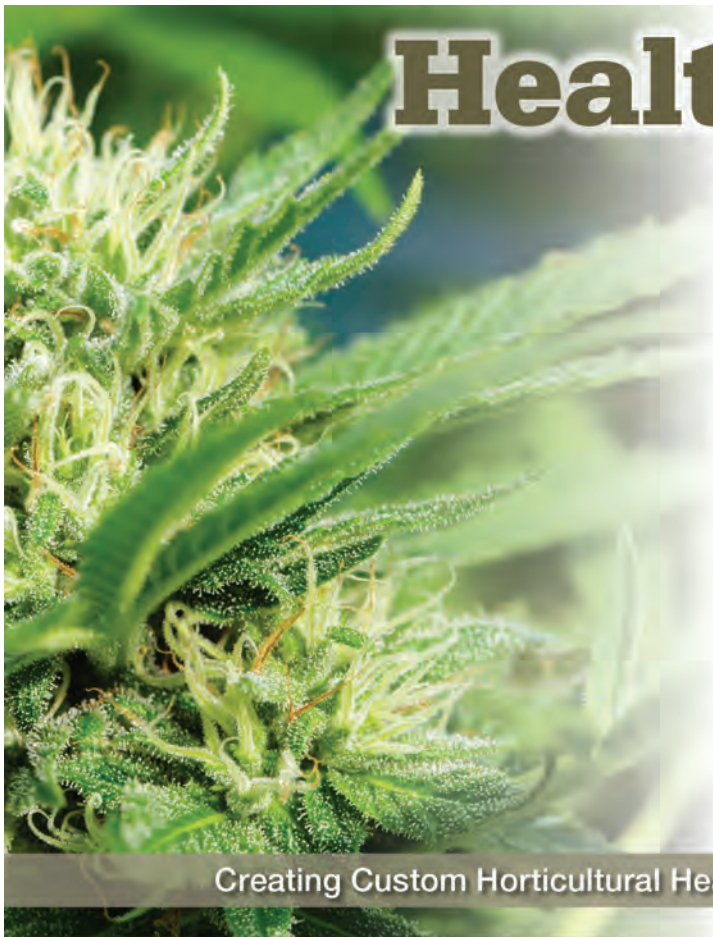
**Smith:** Certain costs ... were a lot more expensive than we thought — the professional services fees: our various lawyers, accountants, those types of things. Along with all the costs of staying into zoning compliance and updating our facilities based on zoning changes. The effort that managing those things took was shocking to me, honestly.

The other thing is ... where everybody ... is knocking on our door, saying, "You guys owe us thousands of dollars."

Whether that's the city of Seattle for business licensing because we deliver to stores in Seattle, or the Clean Air Agency, or the Department of Ecology for our waste materials.

**Wilson:** Are you growing predominantly for medical or recreational sales or both?

**Smith:** We're pretty much focused on recreational simply because it's not really clear



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what's going to happen with the medical market yet. We are ... tentatively watching.

**Wilson:** I think a lot of producers, processors and retailers are holding back to see how it is going to roll out, unfortunately for medical patients. On to a different topic: Is there anything you would've done differently if you could start all over again?

**Smith:** I think ... we would've waited ... to actually go into business. As this market matures, the business environment gets better in some ways. Obviously when we first started, we had that 25-percent producer/processor tax, which just killed us.

Being among the first to be licensed, dealing with local jurisdictions was very difficult because they didn't have zoning things in place ... [or] processes for dealing with permitting. So we were trailblazers, ... running into all the red tape and hoops we had to jump through because they keep changing



Inside Avitas' Arlington, Wash., cultivation facility. Avitas uses an all-organic, living soil-based medium/approach, along with automated lighting and irrigation systems.

their minds on things. So there were a lot of expensive re-dos ... in the beginning that I don't think people face now.

Also, when we first started in 2014, there

were ... I think, like 10 times as many growers as there were stores. The ratios are still out of whack considering ratios in other states, but it's better. ...

PHOTO: JAKE GRAYBROT



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Manganese	0.05	0.05	0.05				
Molybdenum	0.0009	0.0009	0.0009				
Nickel	0.0001	0.0001	0.0001				
Sodium	0.05	0.1	0.1				
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**Wilson:** What is the largest issue you see facing the legal recreational cannabis market?

**Smith:** The race to the bottom in pricing. That's really the thing that is going to make or break this industry. ...

We live in the land of Starbucks and

\$8.00 fair trade coffees and ... the organic movement and sustainable, responsible business practices. It's frustrating to see why the marijuana industry is not taking that approach that so many other industries that have come up in Washington or in Oregon have embraced fully.

I'm not advocating ridiculous pricing, but I am advocating responsible pricing for sustainable business, and I think that with this ultra-obsession with low prices, things will get out of whack and are starting to drive some pretty bad business practices and decision-making.

**Wilson:** Now that you are in the Oregon legal recreational system, what are some of the main differences you see?

**Smith:** Allowing vertical integration in the market is huge. It has its own set of challenges, but I think it creates a lot of different business opportunities.

**Wilson:** Absolutely. Do your plans for expansion into Oregon include retail sales of your product?

**Smith:** We're looking into it. It's really difficult to find a retail location in populous areas in the state. ... I would love to have a flagship retail location.

**Wilson:** There has been action to start a Cannabis Commission with the Department of Agriculture (DOA) in Washington, D.C. Cannabis growers will have to vote on this to get the process going with the DOA, and one outcome will be that cannabis cultivation will be designated as agricultural, which it is not considered yet in Washington state. Do you see that as important to the future of the legal grower in Washington state?

**Smith:** This whole conversation of whether growing plants for commercial purposes is considered agriculture is extremely Orwellian. You have a government redefining what a plant is and redefining what agriculture means. If you grow poinsettias or mint, and you sell them, you're agriculture. If you grow marijuana and sell it, you are heavy industrial. What? That doesn't make any sense.

It's also extremely important for us, as growers, to get together and start putting in place standards and classifications that all other agricultural industries have done in order to promote, to advance and to improve the quality of the industry and the products we are providing.

So, it's extremely important that people support the formation of the Cannabis Commission. ✨

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COVER STORY

# THE HOUSES THAT DA BUILT

By **Brian MacIver** and **Michael Sexton**

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# SE NIA NESS

**RARE DANKNESS' SCOTT REACH  
GIVES US AN INSIDE LOOK AT HIS  
STATE-OF-THE-ART FACILITY.**

## COVER STORY

# A

s the (de)construction crew bangs away behind him, taking down walls with sledgehammers and setting up new ones for his work-in-progress dispensary, Scott Reach looks at his new 54,000-square-foot Denver growing facility and cannot help but feel a sense of surreality.

“Two years ago, this was just a conversation around a table,” remembers Reach, the founder and COO of RD Industries, Rare Dankness’ umbrella company. “I pitched this grand scheme to a few of my friends, and they were like, ‘Yeah dude, no one is going to lend you that money for that,’” he continues with a chuckle.

But this is a dream come true for Reach, a culmination of consulting on more than 300 grows over the last five years and countless more before that. It’s an achievement he ranks up there with breeding one of his signature strains, Ghost Train Haze.

Like many others in the industry, Reach ended up where he is almost by accident. An Alabama-born bike mechanic with a degree in welding and metallurgy, he made his name in the cannabis industry as one of the main members of the Devil’s Harvest Krew (DHK), the storied cannabis-trading group. It is from that trade and hard work that Reach, also known as Moonshine in his DHK days, was able to create and popularize some of cannabis’ most popular and potent strains.

Today, Rare Dankness is already one of the most recognized brands in cannabis, with Rare Dankness strains being grown and traded worldwide thanks to its international seed banks. And while Reach has gone to great lengths to cultivate it, how the brand name came to be was quite serendipitous.

In 2009, when Reach had his Longmont, Colo., medical dispensary, called Stone Mountain (he sold it after realizing how much more complicated a

“IF YOU’RE NOT ON THE TECHNOLOGY SIDE OF CANNABIS, YOU’RE JUST GOING TO BE ON THE FARMING SIDE, AND THERE’S NOT A LOT OF MONEY ON THE FARMING SIDE.”

— SCOTT REACH



dispensary was compared to a growing operation, he says), a regular customer, “this guy who lived up in the mountains,” Reach describes, came into the store one day excited about his next seed purchase.

Reach remembers it clearly. “He was just like, ‘Man ... it’s really rare to see this type of dankness anywhere in the state.’”

Reach and his only employee had a lightbulb moment.

“We were both like, ‘Rare Dankness — that’s a cool name for a strain or a seed company or whatever.’” Officially founded in 2009, Rare Dankness has grown to be a worldwide seed bank, with many of the company’s original strains winning major honors, including numerous Cannabis Cup awards.

With this new Denver facility, Reach wants to extend RD Industries and Rare Dankness’ status as a provider of consistently high-quality cannabis products from coast to coast.

“I just want to be known for ... [having] the exact same product no matter where you’re going. I want to control what our buds look like, how that cure is handled, the oil, everything.”

And he’s not keeping any secrets as to how he plans to do it.

### High Tech, High Quality

When visiting other dispensaries and growing operations, Reach says he sees too many workers “doing very menial tasks that you can easily automate.”



The irrigation room controls all watering and runoff recapture, as well as cleaning/sterilization through Priva Nutrijet and UVLux. Automation is key to cutting costs as prices fall, says Reach. A facility of this size, without such extensive automation in various areas, typically has three to five times the number of employees Reach will have, once the facility is fully operational.

That's why he went out of his way to bring as much technology as he could into the new Denver operation. "We want to start looking at this plant really differently so that we can ... create a more structured and standardized product as we go forward," he says.

One of the most significant technologies RD Industries brought in to the facility was a Priva control and automation system.



---

## FAST TAKE ... WITH SCOTT REACH

### **Biggest challenge in launching and maintaining a cultivation operation:**

"Cleanliness is super hard, and it comes down to how the facility is designed. Have you [made sure] that the guys who are going to be touching plants have taken showers and changed clothes and removed any trace of anything they could have picked up from the outside world?"

### **Favorite aspect of his work:**

"Oh, man – doing exactly what I want to do. ... Now that we're to a point that I know I have income coming in, the stress of that aspect of my life ... ended, I could start focusing more on doing more for the plant and bringing technology into the industry, starting to publicly speak to people about education and regulation and the genetics aspect. It's opened me up really to do whatever I want."

### **A lesson learned the hard way:**

"Business, getting everything down on paper above and beyond ... making people do more than a handshake. ... You can [go] right back to the paper and be like, "This is what was agreed upon."

### **A little-known fact about operating a cannabis-cultivation operation:**

"It's not just growing weed anymore. ... You've got to have a lot of business [skills]. You have to know a lot about politics. You have to know a lot ... beyond just the botany and propagation, and all that. Nowadays with extraction, you'd better know some chemistry or better be hiring some guys that know chemistry."

### **Advice for those looking to start in the industry:**

"Bring whatever talents you have from whatever other industries or workforce that you've been a part of. We have the need for lawyers and political people and IT people ... and engineers and administrative. The list goes on and on beyond just growers and trimmers and whatnot. These are becoming real companies with large workforces that have a myriad of talents and needs. It's important to be skilled in something. It kills me when I hear people that are just like, 'I want to grow. I want to be a grower.'"

### **What keeps him awake at night:**

"Besides my loan payment, thinking of ways to innovate, constantly trying to come up with ways to ... stay ahead of the pack. Honestly, at the end of the day, that's it. I have to stay relevant somehow, and staying relevant is constantly innovating and constantly bringing a fresh idea or creating a fresh idea from an existing idea from another industry."

### **What helps him sleep at night:**

"Knowing that my wife is on board 100 percent with what I'm doing, knowing in my heart that really what I'm doing for the industry and for my family is a positive thing. Yeah, I'm a happy guy. I'm not one of these super-exuberant, get-up-and-I'm-sunshine-and-rainbows, but I'm very satisfied with the position that I'm in and the direction that we're going. Like I said, I have a beautiful, wonderful wife and family that support everything that I'm doing. Really, that's all that matters."

## COVER STORY

Priva is one of the few high-end, commercial-horticulture-system companies that has done business with cannabis businesses, Reach says. (It also designed a system for Tweed's facility in Smiths Falls, Ontario, he says.) And yet it is still a relative unknown to many in this industry. Reach first encountered its systems during a trip to Disney World, which uses Priva's horticulture systems. After doing his homework, he wasted no time in contacting the company.

"Typically when people are talking about Priva, they're talking about clean rooms, industrial-level stuff," he says.

Reach says the Priva system has given him, in addition to a clean room system, better control over his grow-space, from managing irrigation times to humidifying and dehumidifying, and from adjusting temperature to lighting, the latter being one of the facility's key features.

"They turn the lights on in such a way that there's a slight pause in between each light cycling on throughout, no matter what size room you're lighting, so that you never get those crazy spikes in your electricity bill," Reach says, adding that, "in Colorado, ... they base our entire bill off of ... the energy spikes."

The new facility also will be extremely efficient in its water consumption, according to Reach. Graywater will be reused after passing through a UV water filtration system with peroxide injection. As the collected graywater

### RARE DANKNESS

**Launched:**  
2009-2010

ABOUT

**Locations:**

Brand-new growing facility/dispensary in Denver, called House of Dankness, international seed banks across Europe through Rare Dankness' international company.

**Cultivation space:**

54,000-square-foot indoor hydroponic facility, with a development plan for a large-scale, natural light greenhouse starting within the next 12 months.

**Products:**

Flower, seeds and concentrate will be made in-house. Edibles will be made using Rare Dankness products in partnership with edibles companies. Certain strains also will be available in other Denver dispensaries, but the full RD selection will only be found at House of Dankness.

**Estimated production:**

15,000 lbs. per year, once the indoor Denver facility is fully operational.

**Employees:**

Currently employs seven people, increasing to 30 within the next few months, then 55 six months after that.

condensation that's built up on the fan coils, is recaptured and sterilized, and spit back into the irrigation system," Reach explains.

But all that technology going in to maintaining and protecting his harvest



goes through the system, special lamps emitting a UV ray at a specific frequency will destroy any microorganisms that could endanger a crop, "so every bit of irrigation runoff, every bit of dehumidification and

is of no use if he can't control human error. Which is why Reach went a step further in security and access, giving all his growers and employees key fobs and restricting access to where each employee needs to be.

"Each quadrant is its own grow space, so to speak. So the team that is working at the bench floor, they only go on the bench floor. ... Their fobs don't allow them to enter the flower room," Reach says, "which is important for ... overall pest management and cross-contamination within the facilities."

If there were any more measures





he could have put into this high-tech operation, he would have.

“Honestly, if I could have had the little eyeball somewhere in each room so when I walked in, the thing is like, ‘Good morning, Mr. Reach, I would have done that. But no one’s doing that,’” he says with a laugh.

Reach would like to see his highly-controlled and automated facility produce 15,000 pounds of high-quality product when it is fully operational. He’s taking measures to ensure that his customers see that quality by having only the top 30 percent of the buds sold as flower, with

the rest of the plant being stripped and turned into concentrate.

This business move not only allows him to make sure customers get the best buds, but also will allow him to market his concentrates as what he calls “whole-plant extract,” because the plant hasn’t been completely stripped during the defoliation process.

### **High Tech, High Price**

Reach’s friends weren’t entirely wrong when they told him he would not be able to find someone willing to put the money down for him to turn his vision into a

Reach and a technician stand by two 250-ton Daikin chillers, which cool the grow. These are the same type of units used in high-rise apartment complexes or casinos, bottling and manufacturing plants, says Reach.

reality. He met with more than two dozen investment groups and individuals with a pitch that he describes as “let me borrow \$10 million and get no equity.” Needless to say, that was a tough pill to swallow.

And while most of those investors were interested in his project, what they were asking for in return was too steep a price for Reach (steep interest rates and/

## COVER STORY

or equity). He even lost his temper during one of those meetings when a potential investor made an offer with particularly ludicrous conditions, which he says is not uncommon in the industry.

The industry may be a victim of its own success, as booming business attracts what Reach says are “people looking to make a quick buck,” who don’t actually care about the industry and are looking to take advantage of less business-savvy growers.

“We just call it the ‘weed tax,’” he says. “Everywhere you go, in Colorado especially ... if you don’t price it out and shop around ... someone’s going to come to you with a weed tax added onto it.”

But in September 2014, Reach found someone willing to deal with him fairly and he walked away with a (fairly) low-interest (sub 10-percent) personal loan, while retaining 100-percent ownership of his company. Well, along with his wife Pamela.

In 2010, a battle with cancer changed Reach from being a grower and consumer “to actually really, really needing the plant,” he says. During this bout with cancer, Reach doubled down on his devotion to building a successful cannabis brand and seeing the plant legalized.

It was then that Pamela officially joined her husband’s company, realizing that day-to-day administrative matters needed a full-time person. She took over that role so that Reach could concentrate on growing and breeding.

“The difference that she brought to the company was just a little calmer head and better business sense, and a little more professionalism than your typical grower,” Reach says. “At this point, man, I’m just a pretty face,” he says with a chuckle. “The business is the way the business is because of her.”

### Protecting Your Territory

In order to build his brand the way he wanted, Reach needed to control who he works with — which is why, he says, he turned his back on a lot of money and pulled all of his licensing contracts,



including those with cannabis industry players RiverRock Cannabis and Green Man Cannabis, to license his genetics work to himself. This works because he has taken precautions to keep his companies separate.

“It maintains the integrity that we’ve built with the brand,” he explains.

He also needed to structure the company correctly. Under RD Industries is the new Colorado-based company that will operate the Denver grow facility and the dispensary, House of Dankness. Everything sold at House of Dankness will be sold using the Rare Dankness brand, which will be licensed by Reach’s genetics company, Rare Dankness.

Reach plans to use his network to stock certain dispensaries in Colorado. Just probably not too many Denver shops. “My plan is to sell 50 percent of [our product] out our front door. And then the other 50 percent I’ll wholesale out to a variety of places,” he says. “Not only does

it benefit us to be able to send you to a different place in each city, so you don’t necessarily have to come to Denver, but it drives sales toward those businesses that we’re friendly with.”

Reach is not completely against stocking friendly Denver shops. But he also does not want to compete against himself, so some of his more “exclusive” strains, like Ghost Train Haze and Star Killer, will only be found at House of Dankness. Nothing personal, though.

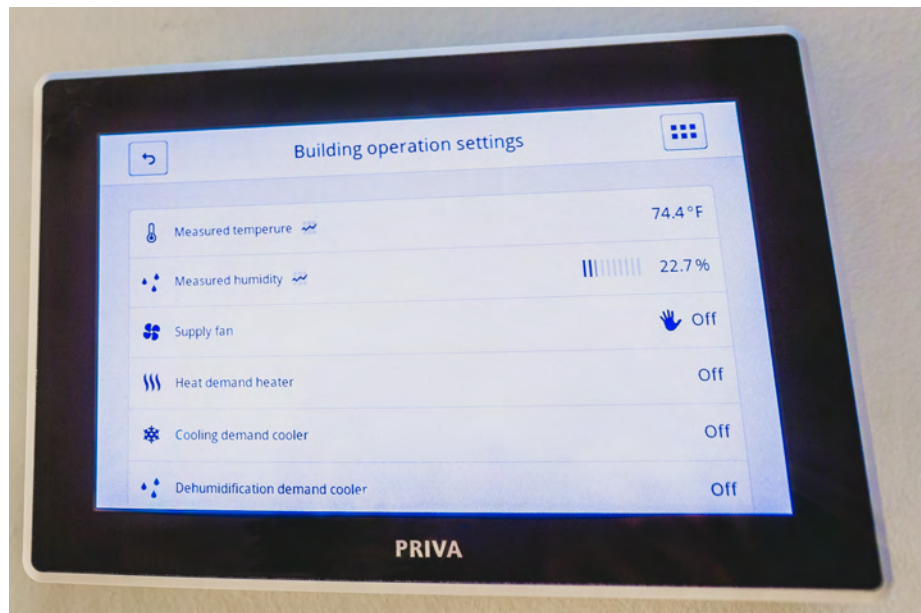
“I spent 17 years in the bicycle industry; it’s just territory protection,” Reach says.

As for edibles, Reach wants nothing to do with making them. Instead, he has set up strategic partnerships with already-established edibles companies like Incredibles and Mary’s Medicinals, where he will provide Rare Dankness concentrates for them to work with.

“That way, we can always ensure that we’re putting material into it that’s



(Left) Two technicians inspect the young plants in the double-stacked T5 area of the veg room. (Right) The Priva touch points [similar to an iPad] outside each room give current readings for temperature, humidity, CO<sub>2</sub>, fan speeds, and more, and enable growers [with high enough security clearance] to review history and/or make needed adjustments.



not going to come back with a recall or any kind of pesticide issue or whatever,” Reach says. “If we’re really trying to create stuff for medical patients, they need to be able to get it [exactly the] same every single time to know whether or not it’s working for them.”

### Spreading the Dankness

Even as the construction crew’s thuds and crashes echo in his ears, Reach is already looking 12 months ahead toward his next big project: a multi-acre, fully automated greenhouse grow. And if he gets his wish, the next Rare Dankness facility will not be in Colorado, but rather Nevada.

“Vegas — I really want Vegas to be our next hub,” Reach says eagerly. The only question mark for his plan is whether Nevada will legalize recreational cannabis. (A petition vote by Nevada residents will happen Nov. 8.) “Las Vegas has a huge tourist population. Those are

the type of things, as a brand, that you have to capitalize on.”

That greenhouse, wherever it ultimately ends up being, will use the same technology and systems as the Denver facility, a move Reach planned from the start.

He sees his Denver facility as a training ground for the future, larger-scale greenhouses, where new employees can shadow growers and learn the systems and protocols (including the Priva system) before being sent out to their new location.

It’s a model he wants to replicate because, as he says, “if you’re not on the technology side of cannabis, you’re just going to be on the farming side, and there’s not a lot of money on the farming side.”

As the industry moves forward, the companies that find success and that will get attention from investors are going to be those who have invested heavily

in facility design and automation, says Reach.

“In 2009, you could have gotten involved for less than \$25,000, got a shop rolling and everything. Nowadays, it takes \$3 million to \$10 million in Colorado just to get rolling, \$15 [million] to \$25 [million] to actually compete with anything.”

That’s why Reach has invested so much in his facility: He hopes that while everyone else is playing catch-up to increasing industry standards, he can rest assured that Rare Dankness will always be one step ahead. ✱

Brian MacIver is associate editor for *Cannabis Business Times*. Michael Sexton is the founder/CEO of Mile High Genetics, a Colorado-based, veteran-owned and -operated company that specializes in veganic, pesticide-free cannabis breeding and genetics. Sexton, a former Combat Marine, has more than 10 years’ experience growing cannabis and is especially skilled at growing at high elevations.

**SYSTEM STATUS**

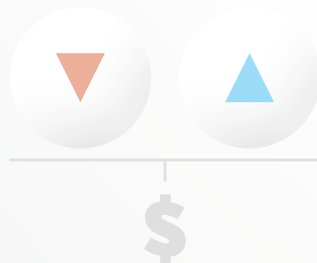
ENERGY %: 71 | HUMIDITY %: 56 | POWER %: 40 | CO<sub>2</sub> %: 26 | LUMENS: 2,200



# The VALUE of **AUTOMATION**

As the industry matures, automating systems give cultivators a leg up in efficiency, yield and crop-loss prevention.

By Jonathan Katz



**W**orkers at R. Greenleaf Organics in Albuquerque, N.M., have to be committed to maintaining a clean, contaminant-free growing environment. Jacob White, chief of cultivation, makes sure nobody cuts corners when it comes to cleanliness.

“I have always believed the two most important things in medical cannabis production is No. 1, cleanliness, and No. 2, your environment,” White says. “You can have the best strains in the world, but if you don’t have a good environment you’re limited in what you can do.”

That’s why White knew he needed to make a change in late 2015. The presence of powdery mildew in 13 of R. Greenleaf Organics’ 14 cannabis grow rooms indicated something was wrong with the environment. Powdery mildew is a fungal disease that thrives in high-humidity conditions. The disease reduced overall yields by at least 25 percent. In one room, 70 percent of the plants were lost, says White.

White attributes at least some of the losses to a lack of automated controls. R. Greenleaf Organics had moved to a 14,000-square-foot warehouse in January 2015. Due to budget constraints, the company relied on rudimentary controls, such as non-programmable thermostats. This January, White installed controllers for each room that automatically adjust CO<sub>2</sub> levels, humidity, temperature and lighting based on set parameters.

Most importantly, R. Greenleaf Organics has not experienced a recurrence of powdery mildew since implementing the automation system, White says.

Automation may include controllers that regulate environmental conditions, such as humidity, temperature, CO<sub>2</sub> levels and light or mechanical systems, such as irrigation systems, seeders or potters.

More than two-thirds (68 percent) of cultivators say they’re using technology to automate temperature control, according to *Cannabis Business Times’* 2016 “State of the Industry Report.” More than half of the growers who participated in the research say they use humidity-control technology.

### A Maturing Market

The trend will continue to grow as the industry matures, says Michael Mayes, CEO of Quantum 9 Inc., an international cannabis consulting firm based in Chicago. As the industry moves from craft

producers to larger-scale enterprises, growers, especially those in newer markets, are incorporating automation into their plans, Mayes says.

Growers in older, more-established markets, such as California, may not have facility designs that were optimized for sophisticated automation systems because of tight cultivation limits, Mayes says. But growers constructing new facilities are beginning to incorporate automation into their building designs.

“Or, they are retrofitting a building that was used for heavy manufacturing, and before any plants go into the facility, they have the ability to build it to spec and run automatic fertigation lines throughout the entire facility,” Mayes says.

In some respects, cannabis facilities are more advanced than traditional horticulture operations because of the younger workforce involved and the unique environment that’s required for cannabis, says Patricia Dean, CEO of Wadsworth Control Systems. “We’ve been in business for 50 years, and these cannabis operations have more equipment than a lot of facilities,” Dean says. “They’re a bit more automated, high-tech than a lot of other horticulture markets.”

Perhaps because many are younger, cannabis growers tend to be more familiar with technology, Dean says. Also, because they’re producing high-value crops, they often work under tighter parameters and are more concerned about optimal



Following an infestation of powdery mildew that reduced overall yield by at least 25 percent, R. Greenleaf Organics installed controllers for each grow room that regulate CO<sub>2</sub> levels, humidity, temperature and lighting.

The Dosatron pumps Good Meds installed inject fertilizer into the water lines based on a dial setting. The mixture flows to drippers located at each plant. The system ensures the precise amount of nutrients are being dispersed at a set gallon-per-minute rate.



PHOTO: KEENAN BROWN | GROOUIP

humidity levels and CO<sub>2</sub> than traditional markets, such as floriculture, she adds.

Some material-handling systems can involve larger capital investments, but present great opportunities to the cannabis industry, says Bill Bissell, senior process design specialist for AgriNomix LLC, an Oberlin, Ohio-based supplier of automated production equipment for growers, from soil mixing, cloning lines and potting machines to fully automated bench movement systems. “We often see smaller grows benefit the most from a piece of automation. They are the most labor-limited folks, so bringing [in] an automation tool ... can be a life-changer,” Bissell says. Such automation is commonplace in other horticultural facilities and can easily be applied to cannabis, he adds.

As the industry matures, price competition heats up and efficiency must be taken even further to lower production costs, including labor and related processes, industry analysts and another vendor *CBT* spoke with say these technologies will become more commonplace in cannabis as well.

In fact, according to Zev Ilovitz, president of Envirotech Greenhouse Solutions, many growers are already making the shift to automating production processes to reduce labor costs. “There is strong interest in mobile bench systems. The efficiency of the cultivation system is greatly increased by moving plants to people rather than people to plants. While mobile bench systems have higher infrastructure costs, customers are realizing that the difference compared to a

stationary or rolling bench system is paid back rapidly with the labor savings that the mobile system provides,” he says.

“Mobile bench systems are very flexible; they can be operated manually, or motorized, in a single or multi-level system,” he adds. “The design and function of a system will often depend on the scale, style and sophistication level of the cultivation facility.”

### Less Work, Greater Yields

Perhaps one of the reasons some cannabis cultivators hesitate to completely automate is their belief that technology should complement human interaction with plants rather than replace it. That’s the approach Denver-based Good Meds — which has a 90,000-square-foot cultivation facility and two dispensaries

— typically takes with its cultivation operations, says Good Meds founder John Knapp. But in at least one area, automation won out over a hands-on approach.

Good Meds opened its current cultivation facility about three years ago. Initially, the company relied on hand-watering and manual fertilization. The process left too much room for error, says Knapp. Employees would get formulations wrong or forget what nutrients they already mixed into the fertilizer tanks.

In early 2015, Knapp implemented Dosatron fertigation systems for each room. Fertigation involves the injection of nutrients directly into an irrigation system. Total system and installation costs were \$80,000, and total installation time was about three months, according to Knapp. The cost includes a complete replacement of the facility's irrigation system to accommodate the Dosatron units.

A series of Dosatron pumps, connected to irrigation pipes, suction nutrients from a tube placed inside fertilizer jugs. The pumps then inject the fertilizer into the water lines based on a dial setting. The mixture flows to drippers located at each plant. The system ensures the precise amount of nutrients are being dispersed at a set gallon-per-minute rate, Knapp says.

Good Meds has realized a 20-percent to 40-percent increase in yields and recouped its investment in the Dosatron systems in less than one harvest, he notes, adding that “even a couple percentage points increase in yields would have paid for that within



Bill Bissell



Jacob White



John Knapp



Michael Mayes

six months.”

The system also reduces the amount of time employees must spend watering so they can focus on other important tasks. “At the end of the day, watering plants is important, but you also have to prune them, you have to train them, you have to make sure the environment is right, so it gives the guys way more time to work on optimizing everything else,” Knapp says.

### Preventive Maintenance

Likewise, for R. Greenleaf Organics, the investment in automation paid for itself quickly and has helped employees focus on other critical activities. “We can put all our energies into growing cannabis and less time worrying about environmental conditions,” White says.

The company, one of three nonprofit businesses operating under R. Greenleaf & Associates, has implemented fully integrated environmental controls in three watering rooms, and upgraded the thermostats and controllers in the remaining 11 rooms to digital, programmable units.

The automated systems also have data-logging capabilities, which helps White identify issues before they become a major problem. Recently, one of the rooms experienced temperatures that were well above the set limit. By observing data patterns, White could see the issue was happening during the evening and that it was a problem related to the air conditioner. Without the data log, White says he would have likely checked the controller first.

White and the company's director of operations installed the system at a cost of about \$250 per room. But White says he wants to eventually have a single environmental controller for all of the watering rooms.

“To get a system installed to meet all of our needs, the cost has been quoted as anywhere from \$1,500 to \$3,500 per room,” White says. “While this is an expense to be planned for, it will easily be evened out by prevention of further infestations.”

### Looking Ahead

Implementing an automation system brought some challenges for White. “A lesson learned was to trust, but verify what hired contractors are selling you. We thought we had purchased one thing, and were given another, simply by completely trusting the contractors at face value,” he says.

As he tries to move toward a single control system, he has received contractor proposals that vary widely. “My expertise is in growing, and not HVAC,” White says.

For many cannabis growers, their ability to scale up will depend on their knowledge of business systems and practices that might, at the outset, be unfamiliar.

White says he has had to ask more questions of suppliers, regarding the different aspects of each system, to be able to gain a better understanding of the systems he is considering and the differences between each.

Cultivators also shouldn't hesitate to consult with the agriculture industry for advice on technology, Knapp says.

“This industry has come out of the black market. So the knowledge and the people that do this kind of stuff don't necessarily have the typical agriculture background,” he says. “It's interesting to watch how the industry came up, and the type of techniques and tools employed in the beginning and how it's evolving. There's a lot more influence from the agriculture industry [taking] hold.” \*

Jonathan Katz is a freelance writer based in the Cleveland, Ohio, area.

A photograph of a greenhouse interior. In the foreground, there are rows of lush green cannabis plants with developing buds. A large, circular, silver metal fan is mounted on the left side of the frame. The background shows the structural frame of the greenhouse and a window looking out onto a bright, overcast day. The overall scene is well-lit and organized.

# ‘DIGGING DEEP’

## INTO GREENHOUSE HVAC

Part II of a two-part series on making the most of an efficient AC system.

By Kyle Brown



**A** greenhouse brings a grow closer to the elements, but the same sun that feeds the plants can also push the temperature far past the comfortable range for cannabis.

One main consideration is whether the greenhouse will be “open” or “closed,” says Nadia Sabeh, agricultural and mechanical engineer for consulting/engineering firm Guttman & Blaevoet. An open greenhouse has some form of air flow from outside the structure, while a closed greenhouse is structured more like an indoor grow and mostly sealed. But even though an open greenhouse has more interaction with outside air, it doesn’t mean the cooling strategy is ... just to open a window, she says.

Depending on the location of the greenhouse, natural, passive ventilation is an option with ridge vents or open side walls, which can be manual or automated, says Sabeh.

### Open Greenhouses

An evaporative cooling pad, or pad and fan cooling, is a common setup for an open greenhouse, says Jeff Lloyd, owner of Emerald Kingdom Greenhouse, a greenhouse supply company in Weaverville, Calif. A wet membrane is hung on one end of the greenhouse with fans drawing outside air through, dropping the temperature. Evaporative cooling also runs with low energy requirements.

“We’ve found that these water walls, accompanied with shade cloth or ground cloth, really can be efficient at lowering [temperature] between 10 and 15 degrees,” he says.

Keith Sprau, founder at Colorado Leaf, LLC, in Pueblo, Colo., relies on a 25-foot by 6-foot cooling pad on the south wall in each of the four greenhouses of his 17,000-square-foot grow, paired off with American Coolair exhaust fans (two 48-inch fans in the veg greenhouses and three 54-inch fans in each of the flower houses).

“We draw the air through there, and our exhaust fans are on the north end,” Sprau says.

The pad and fan keeps cool air moving even at high temperatures, and when Sprau got his original quote for the instal-



PHOTO: COURTESY JOHN SAKUN

The placement and orientation [in relation to the sun] of a greenhouse can make a big difference in keeping cool, especially in a high-temperature climate, says Jeff Lloyd, owner of Emerald Kingdom Greenhouse.

lation, he doubled the size of the cooling setup to make sure he had the capacity to fight the summer heat.

“It’s been 90 all week, and we’re holding at 76 in all the greenhouses, which is nice,” he says.

Another passive way to regulate temperature in the greenhouse is to just dig deep, says Lloyd. Trenching the greenhouse 36 inches beneath ground level reaches a place in the earth where the temperature is roughly always 60 to 70 degrees. “So instead of trying to heat or cool air that may be 100 degrees or freezing, you can get that ambient underground air temperature of 60, and you’re using a

lot less energy to convert to make that 60 degrees hotter or colder,” says Lloyd.

Insulation and ground covering can go a long way toward helping manage a particular temperature regardless of the season, he says, “especially if they’re using a reflective material for the heat.” Placing a reflective ground covering down keeps the heat from being absorbed into the base of the greenhouse in the winter, and ground cloth insulates the cool air inside the greenhouse when used along with an evaporative pad system in the summer.

Just filling the greenhouse with plants makes the temperature more manageable in the summer for John Sakun, owner at



Southern Colorado Growers in Rye, Colo. Between harvest and moving new plants in, a section of the concrete floor is exposed, and there's a noticeable difference, he says.

"The floor is still about 30 percent of the concrete flooring that's definitely absorbing heat," he says. "Once the room is completely full, it'll be a lot easier to manage the temperatures because there's

A closed greenhouse has many of the same HVAC options as an indoor grow, such as a system using a packaged DX or split air conditioning unit, in addition to more passive ventilation methods.

not so much exposed concrete sucking up all that heat. It's literally hot to the touch."

### Closed Greenhouses

A closed greenhouse offers more control over conditions than an open greenhouse, but usually a little less than an actual indoor grow, says Sabeh. In general, however, the closed system runs similarly to an indoor grow.

Beyond packaged DX or split air conditioning units (more on this can be found in Part I of this series in the May/June issue of *Cannabis Business Times*; see box below), she suggests choosing better glass, double polycarbonate or other materials that better insulate.

Part of that insulation process for Sprau meant teaming up with his father and brother as the greenhouse construction was finishing and using, "no exaggeration, about 200 tubes of silicone," to seal the grow as airtight as possible, he says.

"We did every seam, every frame," says Sprau. "We really went overboard. But there's a fantastic negative pressure anytime you try to open the greenhouse doors, and that's what you want."

### Drying It Out

Though the evaporative cooling pad is effective at bringing the temperature down in the greenhouse, it floods the environment with humidity. Sprau uses a Wadsworth controller to manage the grow's levels and relies mostly on those exhaust fans to pull in drier air from outside.

"As long as it's not damp outside, it does a great job of holding within about two percent [humidity]," says Sprau.

If exterior humidity is a factor, a desiccant-based system can help, says Kurt Parbst, director of business development for Envirotech Greenhouse Solutions. (Desiccant is a media that absorbs moisture from the air; that media can then be recycled in a desiccant wheel, which collects moisture, then evaporates it with heat as it passes around the wheel. More

## KEEPING YOUR COOL IN INDOOR GROWS

This article, which focuses on HVAC for greenhouse growers, is a continuation of the feature "Keep Your Cool" in the May/June issue of *Cannabis Business Times*. For information on HVAC issues and solutions for indoor grows, you can find Part I of this feature online at <http://bit.ly/CBT16HVAC>.

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## CULTIVATION

John Sakun, owner of Southern Colorado Growers, uses a radiant heat system to maintain a healthy temperature for his greenhouse during the winter. When weather is cold, a boiler feeds a mix of hot water and antifreeze through pipes under the concrete pad in his greenhouse.



on this also can be found in Part I.)

When growers irrigate, the sun goes down or supplemental lights are turned off, growers can lose control of relative humidity. “Th y’re afraid of getting into fungal pressure,” he says.

After the lights go out, air conditioning units can level out temperature quickly, but plants continue transpiring water into the room for some time after, raising the relative humidity. When facing those high pressures, a desiccant system running parallel to augment dehumidifi ation could make the diffe ence, says Parbst.

Desiccant systems are useful in many situations (like drying in cooler temperatures), but it takes a lot of energy to heat the material, says Clif Tomasini, product

manager for Quest Dehumidifie s.

“You’re paying the price every month in electricity,” says Tomasini.

He suggests keeping the greenhouse temperature a little warmer at night, around 70 degrees, and using a refrigerant-based dehumidifier ystem. That uses the same basic build as an air conditioner, but is geared toward drying air effici tly instead of cooling it. Compared to a desiccant-based system, it uses about a quarter of the energy per pint, he says.

Arleigh Kraus uses a dehumidifier i both of her 1,000 square-foot greenhouses in Knox County, Maine. Humidity is a constant problem when the wind carries in from the ocean, she says. In addition to ventilation and an industrial fan in each

greenhouse, she uses a Quest Power Dry 4000 to manage the pressure.

“In California or Colorado, [ventilation] would defini ely work, but here, you just need [the dehumidifier]” she says. “You need to pull moisture out of the air, especially at night.”

Th ough buying the separate dehumidifi ation system was about 30 percent of the upfront cost of her budget, that money is made up elsewhere, she says.

“The thi g is, you’re basically getting free light. [And] without using a dehumidifie , you’re looking at a minimum of 25-percent upwards to 50-percent loss of product just from mold,” she says. “Th cost of purchasing [a dehumidifier], unning your electric bill [up a bit] defini ely

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## CULTIVATION

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### Fighting the Cold

You have many options to heat a greenhouse, starting with the choice between hot air or hot water, says Sabeh. Either one can run through pipes placed near the grow or in the flooring to provide heat through convection.

Radiant floor heating and cooling is becoming a more common solution for greenhouses, because it places heat near the plants, says Lloyd.

Sakun keeps his grow warm during the winter with a radiant heat system from BioTherm, using a boiler that feeds a mix of water and antifreeze through pipes that run about three inches inside the concrete pad under his greenhouse. The system keeps heat right near the root zone.

Being able to control where the heat is placed is important for each stage of growth, says Parbst. During the vegetative stage of the plant, the root zone is the focus, which means under-crop heating. At the flowering stage, "the root zone and the canopy should be in balance," he says.

For him, that means some heat from the company's Agam VLHC (ventilated latent heat converter) desiccant system, supplemented by hot water heating around the perimeter of the grow or overhead. The system serves mainly to dehumidify the grow, but also can feed some of that energy back to the grow as heat, he says.

Like an indoor grow, hot water also can heat a coil connected to a fan to blow the hot air out into a greenhouse, says Sabeh.

When it comes to hot air from a furnace running on natural gas, propane or other fossil fuels, there are energy caveats. Sakun uses a Lennox propane heater to assist his radiant heat setup, but he relies on radiant heat to get him through winter at a lower energy cost compared to his propane heater.

The choice of furnace fuel generally comes down to how tightly a grower wants to control humidity, says Lloyd.

"One thing about natural gas heaters, when they combust, they create a level of

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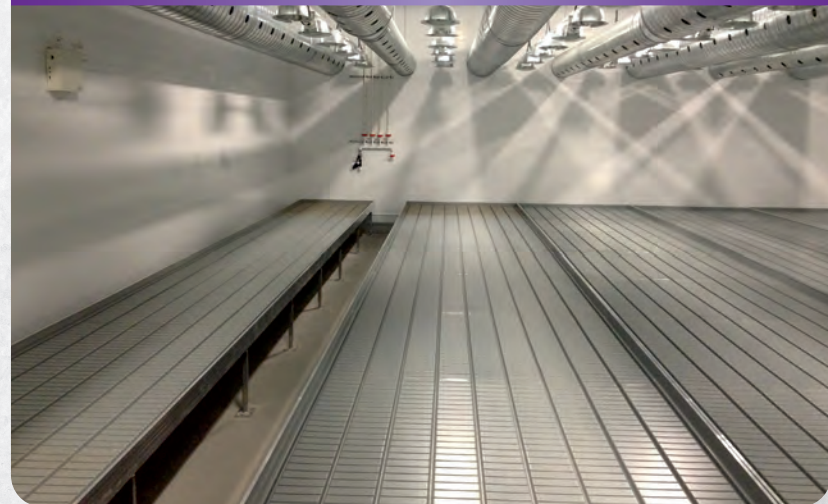
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## CULTIVATION

moisture in that process, so growers who are really worried about molds will sometimes stray away from natural gas heaters and go for electric. The electric is really dry," he says.

He has also seen some clients go with a wood-burning option for greenhouses where that fuel is more available, he says.

Efficiency should be a primary concern, says Lloyd, and growers should look for high-efficiency models even if they cost more up front.

To boost that efficiency, insulation comes into play for Sprau. Whenever he knows a bad snowstorm is on the way, he'll shut all the curtains in the greenhouse to help seal in heat, he says, using about 30 percent less energy for heat.

Another relatively inexpensive insulation trick for greenhouses in a cold environment Lloyd has seen is placing a double layer of film on the outside of a

structure, then inflating that film with a blower.

### Free Resources

The building itself is a factor in keeping cool. The structure's placement relative to sun's path determines how much direct sunlight it will get at particular points of the day, and how much shade, says Lloyd. If a greenhouse is in a high-temperature climate, orienting the greenhouse to provide some relief during the hottest part of the day will save in energy costs overall.

"The guys [in hot climates] can orient their building to the point they're getting some afternoon shade, after 3 p.m.," he says. "Their building is just going to stay cooler. ... Orienting can be a trick to help with your energy costs."

In terms of overall cost, managing the goal temperature in a greenhouse isn't as hefty as it is for an indoor grow,

says Sakun, who also maintains a 4,000-square-foot warehouse grow. For his greenhouse grow, about 10 percent of his overall budget was spent on HVAC systems. But for his indoor grow, "it was almost double; about 20 percent of our overall cost went to AC," he says.

Working with greenhouses to get the most out of potentially cheaper natural resources for heating and cooling is a necessary part of staying competitive in the industry, he says.

"Obviously we have supplemental lights in there because it's a year-round room, but it's utilizing our free, wonderful sun," says Sakun. "If you want to [dedicate] time and effort and money toward your plants, you have to take money away from heating costs, cooling costs, lighting costs. If you can minimize those costs, you can put more effort into the actual plant itself, and that's what we try to do." ✪



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# HAS LAB TESTING TURNED A CORNER?

Expanding testing requirements for growers, proficiency testing mandates for labs, and labs' self-monitoring and equipment improvements are all driving change in this rapidly expanding market.

By Steven Nelson

**C**ommercial cannabis lab testing has come a long way as the trickle of states authorizing medical or recreational markets becomes a steady stream.

And with new rules taking effect, insiders expect the testing sector to balloon alongside the core industry it supports.

The sector has found its footing, people who operate and utilize labs say, as an increasingly robust framework for testing is established in states across the country.

In the past year, Colorado labs have helped carry out Governor John Hickenlooper's zero-tolerance

policy for pesticides as medical growers prepare for mandatory product testing.

In Washington, where one lab notoriously gave off-the-charts THC readouts, new rules require that labs participate in proficiency testing, a step toward ensuring reliability.

Nevada's stringent testing rules — requiring every 5 lbs. of flower to be tested and mandatory terpenes testing — are being watched with interest by neighbors.

And in California, the testing sector is expected to explode when legislation passed last year regulating the state's medical cannabis industry takes full effect.

"The industry believes that California represents 50

percent of the U.S. cannabis market, and that less than 5 percent of the [current California] market currently tests," says Michaela Keller, president and CEO of Steep Hill Labs, a leading lab with locations in Berkeley, Seattle and Albuquerque.

It's unclear if existing labs will be able to handle the influx when 5 percent becomes 100 percent. But they have time to prepare. Testing isn't required to be in place until January 2018.

Derek Peterson, CEO of Terra Tech, which grows and sells medical marijuana in Oakland, Calif., and Las Vegas, says he sees California's lab sector as a potential opportunity for savvy businessmen.

“We wait three to five days sometimes to get test results back, and that’s with the industry not being mandated, so I think we’re going to hit a bottleneck,” he says. “I’m hoping entrepreneurs wake up and say, ‘I know owning a dispensary sounds attractive and owning cultivation sounds attractive, but here’s a hole in the business that people aren’t paying a lot of attention to where there’s significant economic potential.’”

Peterson says his company tests partially “for selfish reasons” to protect against reputational risk, but he believes about 90 percent of his competitors aren’t taking on the voluntary cost.

He says he’s worked with many labs and that over the years, “the testing industry has certainly matured.”

“It has a distance to go to get to the clinical level of other testing, but it will get there because there are people with significant pedigrees, and capital is starting to flow into the industry,” he says.

Opportunity knocks not only in California. Steep Hill, for example, has licensed its name for testing operations in Alaska, Colorado, Nevada and Maryland.

Werc Shop co-founder Jeffrey Raber, a prominent testing expert, says his lab has near-term plans to expand into Oregon after closing a Southern California location last year when Pasadena police arrested him after finding hash oil, production of which is legally dicey in the state.

But Raber, whose lab currently operates in Washington, expects to reopen operations in California in the future. “We are still working on re-establishing our testing efforts under the new laws,” he says. “We will only operate legally under the new laws and had to find a new city to do so.”

Raber says the anticipated boom in California testing still is somewhat far-off, as draft rules have not been formulated, and it remains unclear what the exact testing parameters will be.

The arrest of Raber, against whom charges have not been filed, was not the only shock to the lab sector last year. Months later in November, a well-respected leader of Colorado’s testing community, CannLabs, closed down after going

public, though the exact circumstances around the closure are unclear.

Jeannine Machon, co-owner of Colorado’s CMT Laboratories, says she doubts many other labs are considering going public and that the shock has made fellow owners who respected CannLabs cautious about potential business deals.

CannLabs went under about the time mandatory microbial testing took effect, Machon recalls, meaning for remaining labs “it was a tsunami hitting the beach,” resulting in much more business and a deluge of work.

Machon serves on a state advisory board on pesticide use in cannabis and has had a front-row seat as Hickenlooper’s no-pesticides mandate has been

implemented, a policy scoffed at by some growers who say people regularly eat a small amount of pesticides on grocery store produce.

Hickenlooper’s order, handed down in November 2015, means theoretically that cultivators cannot have any trace of pesticides that aren’t expressly allowed, but Machon says the science isn’t so simple.

“Zero is scientifically impossible,” she says. “We are trying to measure these pesticides in parts per billion and that’s as close as anyone can get, except for non-scientists who just write zero on a piece of paper.”

Machon says she believes a near-zero solution will be offered by the working group, which meets every two or three



A Medicine Man employee takes a lab sample. Lab variations are still a part of the industry, according to Andy Williams, co-owner of Medicine Man. Once, he cut a bud sample in two and sent it to the same lab, getting two different sets of results. But “the differences in testing is getting better,” he says.

PHOTO: MEDICINE MAN

## COMPLIANCE

weeks, and that “I believe the governor will understand that what we come up with is logically zero.”

She adds: “At this point ..., anyone out here using a product not on the [state department of agriculture’s] list of acceptable pesticides is an idiot and deserves to get busted.”

Still, Machon says the ban has resulted in growers using less-effective products and that “we’ve seen potencies go down and the grows get a little more stressed when you have to be a little more aggressive,” by treating plants more often.

Colorado’s mandate that medical marijuana be lab-tested was slated to take effect in July, but the state’s Marijuana Enforcement Division (MED) postponed implementation as it proceeds with proficiency testing of labs to license them for testing medical products.

Machon says potency testing appears to have been kicked to August, and other forms of testing later, but the MED has not officially said so.

### Reliability on the Rise

Proficiency testing aims to assure labs give



Andy Williams



Jeffrey Raber



Jeannine Machon



Derek Peterson

accurate readouts. Some labs voluntarily participate in group “ring tests” to tighten results after wide variations among labs in the past undermined credibility.

Sampling plays some role in varying results, but to improve accuracy, labs recalibrate expensive, complicated machines. There’s a general consensus among labs and their customers that results are becoming more reliable.

Andy Williams, co-owner of Medicine Man, a large Colorado cultivation and dispensary business serving recreational and medical users, says years ago he scratched his head at lab variations.

Once, he says, he sent what he believed to be two near-identical samples to different labs and got different results. Another time, he cut a bud sample in two and sent it to the same lab for testing. The results “raised our eyebrows,” he says.

But he says, “The differences in testing is getting better,” as variances have narrowed.

Williams says he used testing to ensure his 40,000-square-foot cultivation facility wasn’t affected by mold, and says he sought pesticide testing before it was required, to stay ahead of the curve.

“Testing has helped the industry give consumers a sense of safety, one more distinction from the black market,” he says. “It’s also been helpful on advertising. Customers can look for potency high or low.”

Medicine Man has two dispensaries and is preparing to open a third storefront using the single grow site.

California’s lab sector is a potential opportunity for savvy businessmen, according to Derek Peterson, CEO of Terra Tech (lab shown here). Entrepreneurs already look at owning dispensaries or cultivation operations, but often pass over lab testing as part of the process.

“We’re going to double our production in the same amount of space,” Williams says. “We’ve run experiments like any manufacturing facility,” fiddling with nutrients, mediums and using test rooms to try out innovations. “Testing is a big part of learning how to do things better,” he says. “We test our ingredients because everything is not always listed on the label.”

Behind the scenes, labs have worked intensely among themselves to tighten results. The Emerald Test, a collaborative lab endeavor, has led the way to help improve cannabis testing. The test, offered twice a year, sends a sample to a large number of labs, who then are informed how their results match up against other facilities.

Machon says it’s unclear what the future holds. But she’s optimistic for the testing sector as professionalism, sound science and expanded requirements take hold.

“If you go back two years ago, there was a scientific conference put on by Emerald Scientific with 80 people,” she says. “The Emerald Conference this year had hundreds and hundreds.”

On the finer points, there’s less certainty. Are Nevada’s touted strictures wise or overkill? Is Colorado allowance of testing gaps for growers and edible manufacturers who establish process validation a good idea? Machon says she doesn’t know.

“This is still, for everyone, the grand experiment. Who’s to say who’s right and who’s wrong?” \*

Steven Nelson covers legal affairs and drug policy for *U.S. News and World Report*. He lives in Washington, D.C., where a green thumb would be useful.



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# 14

## Tips for *Hiring and Working* With Consultants

By Margaret Battistelli Gardner

It's not unusual for new cannabis cultivation operations to need assistance in what can be a very challenging business. The same holds true for those in existing markets, who are expanding and could use guidance.

Regardless of what kind of help they need, business owners can find a broad spectrum of consultants to guide them. Consultants and management companies can assist in areas such as license applica-

tion, staffing plans, facility design, system implementation, security setup, standard operation procedures (SOPs), cultivation procedures and strategies, OSHA compliance and state-specific regulatory compliance, among many others. Costs associated with third-party advisors can vary as much as the range of services they offer — from expensive upfront fees, to partial ownership, to deferred incentives and everything in between.

James Lowe, co-founder and president at MJardin Management, cautions that most of these subjects can vary greatly from state to state, so it's important to be educated on state-specific matters — or to hire someone who is.

"Before marijuana was legal, the people who were growing and selling it, obviously, were doing it underground. There was no regulation, no quality control, no employee or HR needs to focus on," says Drew Youpel, director of operations at Milestone Safety Group, a safety and risk management consultancy. "Now that legal marijuana has taken off at such a rapid pace, you have all the regulations and the burden of figuring out how to do this the right way.

"Now it's pretty much like any commodities-based business, like corn," he adds, and, therefore, in addition to the plethora of industry- and state-specific regulations, cannabis businesses face the same federal standards and compliance issues as those businesses in other industries. "All of the regulations are already in place. The marijuana industry needs to get compliant right now. It can't be 'down the line.' There is no grace period," he says.

Hiring a consultant is, in many areas, a preemptive strategy that can prevent costly violations or mistakes, increase profitability, effectiveness and quality, and lessen environmental impact, says Nic Easley, CEO of Comprehensive Cannabis Consulting. For example, it can help a business document its procedures to ease the transition period when people change jobs (e.g., if a lead grower leaves). And it can help cultivators see the big picture when it comes to issues they may be having.

"Someone could come to me ... [thinking] they need [answers to] three things," he says. "But ... where they see three, I see 30. Often the problem is much deeper than they initially think, and it takes someone with years of experience in different aspects of the business to see that."

As in any business, finding the right consultant can be tricky, and keeping that relationship — once you find it — an active work. Following are tips to help you find

and maintain good working relationships with industry consultants.

### Know What You Need and What You Can Afford

"First and foremost, growers need to be prepared with what the problem is and what element of their work they need help with," says Jay Czarkowski, founding partner at consultancy Canna Advisors. For example, do they need help with licensing, facility design or pest management, or overall business strategy or operations?

If you have specific issues, find a consultant with expertise in that specific area, Lowe says. But, he adds, if a cultivation business owner needs help with just about everything or a variety of things, "then hiring a management company might be the better option, as those companies are more full-service with a broader scope of knowledge."

Also, put a lot of thought into how much you're willing and able to pay for help. Most consultants will work with businesses to find a comfortable price point, Youpel says. But to get there, he adds, the client needs to clearly outline budget limitations.

### Do Your Homework

Cannabis business consulting is, of course, a business. Lowe cautions that "every consultant will say they are the best, have the newest technology and will increase profit."

Due diligence is key. As Czarkowski, advises, "trust, but verify."

Check out the consultants online, beyond their own websites, suggests Easley. Are they out in the industry, speaking and writing articles? Are they established



James Lowe



Jay Czarkowski



Nic Easley



Drew Youpel

thought leaders? Ask for and check references.

"You're looking for credibility, not marketing," Easley cautions. "You might not need the 'biggest and the best,' but it can't be somebody who read an article in *High Times* once," and thinks he's an expert.

But the homework doesn't end there. Good consultant-client relationships are based on synergy and a shared vision. It might be as obvious as an outdoor grower not syncing with a consultant experienced only in greenhouse growing, says Avis Bulbulyan, CEO at Bulbulyan Consulting Group. Or it might be something deeper, involving scope, goals, standards, etc.

"Have a list of questions ready when you go in to talk to a consultant, and write down everything you want them to know about your business, your issues," Bulbulyan advises. "This is a new industry; there are a million and one things going on, and it's easy to get distracted."

### Start Small

Initial meetings with consultants are for testing synergies, discussing needs and expectations,

and working on budgets — not for negotiating free advice. Trying to "pick a consultant's brain" without paying for the privilege can get things off to a bad start, Easley says.

He suggests hiring a consultant for a small project to see how well you work together. Either it'll be a fit or you'll save money and heartache by figuring out early on that it's not.

Even if you are sold on one person or company, "Don't marry a consultant until

PHOTOS: JEFF WARNER PHOTOGRAPHY

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## FOR STARTERS

you know he's a good kisser," Easley laughs. "Start small, with very specific deliverables. And then scale up. If it goes well, then you can expand the contract."

### Communicate

Business or personal, relationships are relationships. And communication, of course, is key.

Clear, concise communication has to start in the first conversation of the prospecting process and continue through to dotting the last "i" on the agreement. It's especially crucial to set and maintain clearly defined expectations and outcomes. If no one is clear what is expected to happen at any given stage, accountability goes out the window, and no one can be sure whether or not the relationship is working as hoped. And if it's not, why not.

It's also important, Easley says, to create a clearly defined scope of work that takes into account as many scenarios as possible, including any potential stumbling blocks and how they'll be handled.

Consultants should be accessible and responsive, Czarkowski says, suggesting that regular conference calls, cloud-based file sharing that's available to members of both sides of the team, and ongoing updates are all important elements of the client/consultant relationship. Clients need to keep the lines of communication open as well, he adds, and make any necessary information available to their consultants.

One obstacle to effective communications, Easley says, is a client's fear of giving away too much proprietary infor-

mation — especially when the client is established, doing well and aspiring to do better.

"But you need to expect to be open and transparent," he says. "A good consultant is going to ask a lot of questions. You have to be ready and willing to answer them."

### Check Your Ego at the Door

No matter why you're hiring a consultant, you are paying for their expertise. Still, Bulbulyan says, many clients resist heeding consultants' advice.

"A lot of times, a grower will ... pay the consultant and then tell the consultant what he wants to do," he says. "One of the advantages of having a consultant is that they have experience with ... different ways of doing things ... whereas the client may only know ... his own way of doing things. Remember, taking advice doesn't take away from you being a good grower; it doesn't do you any good to pay someone for advice and then not take it."

Easley adds that when client/consultant relationships sour, it's often because the grower is "too headstrong and unteachable" or the consultant lacks the ability to communicate well. Or both.

Finally, in addition to heeding advice, Bulbulyan recommends "really getting your money's worth" by making sure the consultant explains the "why" behind the advice she is giving.

"If you hire someone to write a business plan, for example, it's one thing to have them ... hand it to you," he says. "It's totally different to have them explain the reasoning behind ... why it was

## TIPS AT A GLANCE

1. Know exactly what you need help with. For example, is it overall operations, or specific areas of growing, such as establishing and implementing an effective integrated pest management strategy? Do you need help with just the license application or an overall business plan, financial projections and more?
2. If you have a specific issue you need help with, find a consultant with expertise in that particular area.
3. Clearly outline your needs to effectively communicate them to a prospective consultant.
4. In addition to outlining specific needs, set a budget for what you can afford to spend.
5. Do your due diligence on any consultant you are leaning toward working with. Research them online, and ask for and check references.
6. It can be helpful to look for consultants with experience in a regulated industry.
7. Look for a company with experience that aligns with your needs and standards [e.g., greenhouse management experience, if your needs are regarding greenhouse operations, or pesticide-free growing expertise, if that is your goal].
8. Have a list of questions prepared for meetings/conversations.
9. Consider testing the waters — working with a consultant on a small project, or a piece of a project, before signing a major contract with them.
10. Both parties should set clear expectations of the other party, and clearly define what they will deliver to the other party.
11. Be prepared to share business information with your consultants. (Good consultants will not share information about your business outside of what is necessary within their company, but as a precaution, having them sign non-disclosure agreements can be useful as extra protection and for peace of mind.)
12. Ask for regularly scheduled updates from the consultant for any project.
13. Enter a relationship prepared to be open to the consultant's advice. Your way of doing things is not necessarily the best, and you are paying for their expertise.
14. Ask your consultants to explain the "whys" of what they're doing so that you can learn and not just implement changes blindly.

written that way."

Overall, working with consultants is a two-way street that relies on clear expectations, open communication, accountability and results. With that in mind, consultants can be invaluable resources in helping

you launch or expand your business, or address a set of specific challenges. ✱

Margaret Battistelli Gardner is an experienced editor and writer, and is a frequent contributor to Cannabis Business Times. She can be reached at megmgardner@aol.com.



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# GENE WARS

THE GENETIC LANDSCAPE MAY BE ABOUT TO CHANGE DRAMATICALLY AND AFFECT GROWERS EVERYWHERE.

BY KENNETH MORROW

**W**here will you source the marijuana cultivars you intend to grow? Given that there are thousands of cultivars available today, with many more to come, do you know where they have come from and how you will utilize them? Many fail to recognize the importance of genetic diversity. However, genetic diversity is why not all seeds are created equal. Therefore, the clones, seeds and tissue cultures produced from different cultivars will vary.

So, where do the cultivars (genetics) of today come from?

The Tru|Med Arizona cultivation facility.

PHOTO: KENNETH MORROW



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**LANDRACES:** A landrace is defined as a traditional plant variety that has been selected by local farmers. Landraces were the basic foundations of the cultivars we know today. Today's growers utilize hybrids. Only a few grow Old World landraces because they typically require a longer maturation time and are less potent than hybrids; but there are some incredible growers, such as The Highest Grade, who are now growing and investigating the properties of these Old World gems. I expect to see a resurgence of boutique landrace production in the near future.

**HYBRIDS:** Hybrids result from crossing two different landraces, breeder's varieties or cultivars. Today, most hybrid cultivars are considered to be in the public domain. [More on that later.] Hybrids are what are predominantly grown today, along with landrace variants and pure-lineage Afghan cultivars.

**BREEDERS (THE SHORT VERSION):** In the 1960s and 1970s, cannabis consumers and aficionados traveled the world. Many places they traveled were source countries for marijuana and hashish. These travelers noticed the unique characteristics and diversity of phenotypes compared to the imported marijuana to which they were accustomed. Many brought seeds home from places such as Afghanistan, Pakistan, Lebanon, Morocco, Nepal, Tibet and India, as well as grew seeds from imported Mexican, Colombian, Jamaican and Thai cannabis.

Thus began the selection and breeding that produced the hybrid cannabis cultivars we know today, and that continue to be bred to produce the cultivars of tomorrow. Seed companies began breeding specialized seeds and offering them for public sale from Holland in the early 1980s. Thousands of cultivars have been bred since.

With the change in state cannabis laws, some seed companies have begun breeding and selling seeds here, as well. Today's breeders have spent tens of thousands of dollars marketing their companies and genetics lines; hundreds of thousands more have been spent developing their breeding programs and producing the seeds they sell. But after being sold and in the hands of the public for 365 days, the hybrids are



CULTIVARS THAT ARE **NOT IN THE PUBLIC DOMAIN**, ARE EXCLUSIVE TO THE BREEDER AND HAVE UNIQUE CHARACTERISTICS **ARE PATENTABLE FROM NOW ON.**

classified as "public domain," meaning that just like the landraces, these seeds are considered public property that cannot be patented or protected. There has been no exclusivity.

But what does this really mean? It means a company can do anything it wants with public domain genetics. The cannabis world essentially can be a free-for-all with no acknowledgment nor financial reward given to the breeder.

Without patent protections, it is not legally necessary to compensate breeders, so growers are left with a choice: do the right thing and form a licensing agreement with the breeder to produce his cultivar; or, use the breeder's work without permission (and put the onus on the breeder to decide whether to try sue for compensation), in which case, you might as well steal anything you desire, rename it after your mom and call it your own.

The decisions a company makes from the start ultimately will earn or lose the

consumer's respect. By making ethical decisions, you ultimately will be recognized and respected.

### A Patent That Could Change the Future

Recently, however, something happened that could significantly change the landscape for breeders. *Vice* magazine revealed that on Aug. 4, 2015, U.S. patent number 9095554 was granted for a cannabis cultivar that contains significant amounts of THC – the very first of its kind ever granted. *Vice* reported, "A spokesperson for the U.S. Patent and Trade Office confirmed that officials are now accepting and processing patent applications for individual varieties of cannabis, along with innovative medical uses for the plant and other associated inventions."

I spoke with a representative of the firm [Cooley LLC] that filed the patent, and it is as legitimate as any other plant patent.

The implications of this granted patent are many.



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What is patentable and what is not? **Cultivars that are not in the public domain, are exclusive to the breeder and have unique characteristics are patentable from now on**, based on the precedent set by U.S. Patent 9095554. All existing genetics, be they landrace, hybrid or anything else available to the public, are not.

So how will all this be sussed out and enforced? No one really knows. The only thing certain is it will be a huge legal battle, many times over. A lot of money will be spent on lawyers, for both enforcement and defense.

How will it be proven that a given cultivar existed in the public domain? Recently formed groups are dealing with this issue and many other genetics-related subjects, such as the Agricultural Genomics Foundation of Colorado, which is working on mapping DNA and marker identification. The Open Cannabis Project (OCP) is collecting cannabis DNA samples to publish in a massive database to determine if a given cultivar was available to the public before or after it was patented. In conjunction

with Phyllos Bioscience, OCP is offering an incredible, 3-D, interactive online guide that visually portrays the genetic relationships of almost 1,000 cannabis samples using genetic data (Galaxy.Phylosbioscience.com).

Before you source your genetics you need to consider a few more things.

- Will you start from propagated clones?
- Where will you obtain them?
- Will they be the most desirable representation of a given cultivar?
- Are they free of pests and diseases?

Or will you start from seeds? If so:

- Where will you obtain them?
- How many seeds must you germinate, cultivate, mature and bring to flower to get the most desirable representation of that cultivar, which includes the labor and time-intensive process of eliminating male plants? (It is now possible to determine sex by genetic analysis.)

All of this takes a lot of time and funding,

especially if you intend on cultivating many different cultivars. And once again, you are faced with those crucial questions:

- From whom will you source?
- To whom will you pay royalties or licensing fees?
- Will you just jump into that aforementioned free-for-all?

Seed breeders from this point on will need to retain some form of exclusivity for the genetics they develop, meaning patenting and licensing, which, in turn, means a cultivator and a retailer can legally associate their branded products with the appropriate breeder. It's all about to get very complicated.

But legalization will bring advancements, too, such as tissue culture, and cellular division and replication (not genetic modification), which will allow for the production of millions of like specimens that are all-female, sterile in that there are no bugs or disease infestations, and are perfect examples of a given cultivar. These plants will be patented, branded and will come with exclusive licensing agreements and contracts for royalties, which again leads to exclusivity.

There will always be public domain genetics and those that breeders choose to keep public in the future. In the end, however, either the cannabis industry protects itself and the intellectual property (IP) it has pioneered

In conjunction with Phyllos Bioscience, the Open Cannabis Project is offering a 3-D, interactive online guide to visually portray the genetic relationships of almost 1,000 cannabis samples using genetic data.



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and created, or the newly emerging corporate entities will do so.

The cultivars you grow are also to some degree dictated by available space, the intended growth method, and the environment you choose. Indoor or greenhouse production can each accommodate various growth methods. Will you grow small, medium or large plants? Will you train/spread out [aka screen-of-green] the plants? Use large containers? Small containers? Grow in the ground?

Many of the landraces mentioned earlier are referred to as sativas – narrow-leaflet cultivars. These typically take longer to mature and require a longer flowering period. They can be a challenge to cultivate indoors en masse due to their size. They also have a

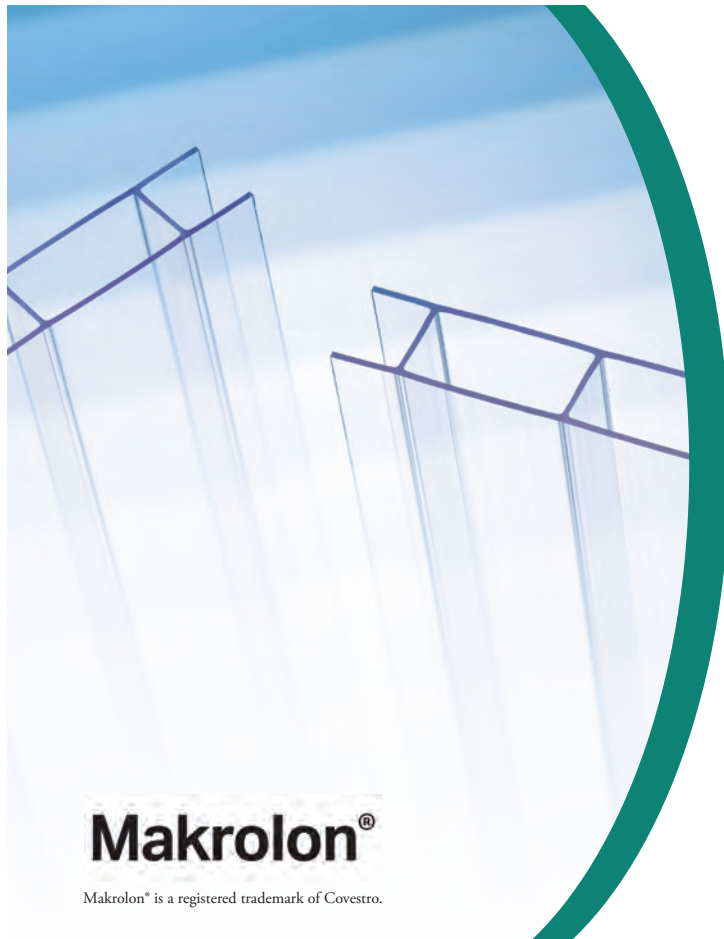
higher cost of production because of these traits. But traditional pre-Afghan cultivars are now being re-investigated – greenhouses are perfect for cultivating them, as are market conditions and many growers' desire to provide more diverse offerings. And growers will explore further what beneficial properties these cultivars have and which can be utilized in future breeding programs, ultimately resulting in thousands of new cultivars in the future.

To some extent, genetic diversity and varying maturation times also will dictate what method and environment you choose, in that it is labor-intensive to grow cultivars that mature and finish at very different rates. Whenever possible, try to grow plants that mature and finish at approximately the same time.

### The Ever-Present Fear

Many in the cannabis industry fear corporate

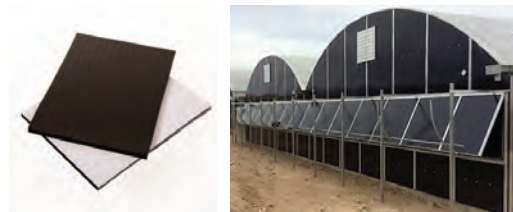
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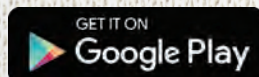
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takeover of cannabis genetics. They fear monopolization and the legal avenues available to biotech corporations and others, such as tobacco companies. Again to quote the *Vice* article, "When contacted, Monsanto claims it has no interest in cannabis production or cannabis seed production. A tobacco representative stated that they also have no interest. But that does not mean they won't be if federal restrictions are ever lifted."

I recently had a conversation with someone (who prefers to remain anonymous) who was asked to attend meetings with representatives and/or ex-employees of global agribusiness Syngenta Corp. (He was unclear on who all the attendees were.) The impression this person was left with was that Syngenta was definitely investigating the genetics of the cannabis plant.

And pharmaceutical interests are already being put to action.

Hortapharm B.V. was founded in 1990 in

the Netherlands by David Watson, and together with David Pate and Rob Clarke, they obtained the first license issued by the Dutch government to open a cannabis research facility. Hortapharm pioneered the concept of breeding plants to produce single compounds and licensed varieties to GW Pharmaceuticals for the manufacture of pharmaceuticals. Hortapharm created cultivars that produce virtually single cannabinoids, approximately 98-percent THC or

CBD relative to the total of other cannabinoids present.

Keeping in mind that research official began in 1990, 26 years ago, it amazes me how fast everything cannabis-related is about to accelerate globally. Therefore, when cannabis is rescheduled and if federal restrictions are ever lifted, the legal realm of cannabis will quickly become very murky and very profitable for attorneys. And it will become very expensive to protect your IP. ✨

**About the Author: Kenneth Morrow** is an author and writer who has been covering cannabis-related subjects for more than 20 years. He is the owner of Trichome Technologies™, a cannabis research and development company. Morrow also is an award-winning grower and breeder. He has made contributions to many of today's extraction methodologies and holds multiple patents in the field. He currently specializes in product formulation and consults on all cannabis-related subjects. Find him on Instagram [TrichomeTechnologies] or Facebook [Trichome Technologies].



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# TIPS FOR OUTDOOR OR GREENHOUSE EXPANSION

BY NIC EASLEY AND ADAM KOH

**M**uriad reports published during the last year have pointed to the energy-intensive nature of indoor cultivation operations. Simultaneously, legal cannabis markets have experienced falling prices. For commercial cultivators – the majority of whom grow indoors – declining prices means shrinking margins and a necessary emphasis on efficiency. To ameliorate the high costs of indoor gardening and falling market prices, many businesses are seeking to

**The drive for efficiency is prompting many growers to supplement or replace their indoor operations with outdoor or greenhouse grows. If you're among them, this guide will help.**

establish new operations or convert existing ones to greenhouse or outdoor models – logical solutions, since economic factors will eventually dictate that cannabis be produced just like virtually every other agricultural commodity (not indoors). Converting to more traditional, large-scale agricultural models, however, takes careful planning and deliberate strategies.

If you are considering cultivation approaches that rely primarily on natural light, this column will help guide you. As the challenges and costs are unique to your business's geography, there is

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no universal solution; but the considerations and questions that must be addressed would apply to anyone considering a change in cultivation model.

### State and Local Laws

As always, regulations and compliance requirements dictate much of what is feasible in the cannabis industry. Consequently, before barreling full speed ahead, thoroughly investigate state and local laws. For example, even though a state might allow and license greenhouse and outdoor cultivation sites, the city or county in which you are looking to establish your operation may not.

Just as important is anticipating coming regulatory changes. Speak to local government representatives, industry groups or individuals familiar with the area to see which way the regulatory winds are blowing. Numerous projects have been negatively impacted and even abandoned because of changes to local cultivation ordinances.

### Site Selection and Land Acquisition

Indoor cultivators have to worry about whether the energy grid in their area is sufficient to support operations. Although this will usually not be an issue for those employing natural light, other considerations and questions must be addressed:

- Water rights and associated laws, especially in arid Western states.
- Is the site susceptible to wildfires or other damaging forces of nature?
- How much land management (e.g., grading) might have to be performed prior to construction, and is the work feasible based on environmental or other regulations?
- Is the site surrounded by traditional farms employing pesticides illegal for cannabis, thus threatening your product's compliance through the possibility of spray drift?
- Is hemp cultivated nearby, raising the possibility of unwanted pollination?
- Will employees and supplies be able to reach the site easily?
- Will odors be an issue for neighboring homes or businesses?

Specific regions and climates will raise additional questions.

Solutions to some problems can exacerbate others.

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1. Check state and municipal regulations and zoning carefully when expanding or selecting a new location.
2. Get a sense of the long-term, local regulatory climate. Are changes likely?
3. Research the local energy grid/supply, water regulations and other environmental considerations.
4. Evaluate and ensure feasibility (with local laws) of land adjustments/construction.
5. Research the neighbors, including neighboring farms and their practices.
6. Consider climate.
7. Consider employee access (and ability to attract quality employees to the location) and distance to retailers.
8. If seeking funding, prepare detailed financials, and consider differences between indoor, outdoor and greenhouse production in modeling your projected costs and revenues.
9. Set goals for grams per square foot of canopy vs. grams per watt of light.
10. Set goals for the number of annual harvests.
11. Understand that pest issues may be less of a concern.



bate others. For example, a remote location may eliminate odor issues, but can make it difficult to attract employees, who might face long commutes or even moves, or increase costs to transport product and cash securely. Balancing different priorities is perhaps one of the most difficult aspects in locating an optimal site. An informed decision-making process is the key component in creating a successful, long-term business model.

### Seeking Funding

The reality of a cannabis startup or expansion is that significant capital is required, so many early-stage businesses must seek funding. This requires detailed financial articulation documents to present to potential investors.

In regard to costs and cash flow, cribbing from an indoor operation's pro forma will not suffice. Many fail to realize that the operation's

scale and production volume can be greater than an indoor facility. You can produce more per square foot with natural light, and most indoor cultivation facilities aren't as large as they seem (actual cultivation space is even smaller). You also can achieve multiple turns via hoop houses or greenhouses.

The timing of expenses and management of cash flow for an outdoor or greenhouse operation also differs from an indoor grow. Large outlays for supplies and labor at the beginning and end of the agricultural season, respectively, are typical for outdoor farms, compared to fairly consistent indoor-facility expenses.

### Production

Until relatively recently, most indoor growers were employing the same lighting technology and turning between four and six harvests per year. "Pounds per light" was a straight-

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forward way to judge efficiency and productivity when cultivation methods were fairly homogeneous. Then, new lighting technologies prompted cultivators to evaluate their performance by calculating “grams per watt.” With natural-light-fueled cultivation, the best way to compare productivity across diverse approaches and methods is to figure out how many grams per square foot of canopy are being harvested.

Once a realistic production figure has been established, the next step is to figure out how many harvests are achievable. Some cultivators are working hybrid sites that combine various permutations of greenhouse, outdoor and indoor approaches. Sophisticated greenhouses can be constructed to run year-round. Simpler hoop-house structures may be able to achieve between two and four harvests a year via light deprivation, depending on climate and the flowering time of the varieties being grown.

### Revenue

Finally, consider the product processing and sale/market potential to accurately gauge potential revenue and demonstrate return on investment for potential financiers. It is a widely accepted reality that consumers in most markets still prefer the polished appearance of indoor-grown flower. That doesn't mean the outdoor or greenhouse grower is doomed to accept lower prices, especially as the quality of product grown under natural light could be equal or even significantly higher (more on this below).

Still, reserving a larger portion – or even all – of one's crop for extraction may be a prudent business model, especially considering the ever-increasing popularity of concentrates and infused products. Such an approach has the added benefit of elimi-

nating the costs and labor associated with drying, curing and trimming flowers.

### Rapid Growth vs. Incremental Expansion

Automation is always desirable, but much of the mechanization that allows traditional agriculture to be performed at extremely large scales has not yet been tailored to cannabis to allow them to harvest large areas in minimal time. For example, you may have seen automated tomato or grape harvesting machines, or tulips being topped en masse. We are getting there in cannabis with trimming machines and such, but again the scale just isn't the same. Therefore, it might be prudent to plan for incremental growth; start with a manageable size, then as expertise and technology improve, scale into a larger model.

Starting small also can make sense to avoid large-scale, high-cost mistakes. Many growers say they are glad they started out smaller and scaled up slowly, as they learned valuable lessons from smaller-scale mistakes that they could then roll out correctly on a larger operation.

### Pest Management

Some growers desire to move outside, but fear that if they already struggle with pest problems indoors, they will not be able to successfully bring in a crop from an open field. However, numerous factors can make cultivation under natural light less likely to face pest issues compared to warehouse growing. Our own experience and that of other cultivators growing outdoors tell us that, while pests can of course be present, they do not often take hold and become an infestation. This is due to the presence of other insects and organisms that help keep

populations of damaging bugs in check.

The natural variations in temperature and humidity between days and nights also keep pest populations from exploding; the optimal conditions for the growth and reproduction of spider mites, for example, are not maintained for long, uninterrupted stretches, as they are in indoor grow rooms. Finally, UV light spectrums – which are generally not present in significant amounts in lamps used indoors – have anti-microbial properties and can help keep your crops free of molds and mildews.

### Product Quality

As noted above, many still prefer the polished appearance of indoor-grown product, but others find outdoor- and greenhouse-grown flower to be more aromatic and potent. Some growers say it's more difficult to get that consistent, manicured look outdoors, but that it is possible with the proper manpower and care for the plants.

It would be useful to see a controlled comparison of test results analyzing the cannabinoid and terpenoid profiles of the same genetic grown under various types of artificial lighting alongside the same strain grown under the sun.

### An Important Decision With Numerous Potential Benefits

As you can see, there are a number of considerations to ponder when trying to decide whether to take your cultivation operation out into the sun. There are also significant benefits: Heavy yields of high-quality product, much lower cost of production and natural pest control are all achievable, if you can clear the many hurdles to planning, developing and running a well-functioning cultivation site. ✨

**About the Authors:** **Nic Easley** (*right*) is the founder and CEO of Comprehensive Cannabis Consulting (3C). A decorated veteran of the U.S. Air Force, Easley established a 35-acre organic farm in Colorado after completing his military service, and has degrees in biology and environmental studies. Over the past eight years, Easley has consulted with more than 60 clients in Colorado and formed 3C to bring organic, sustainable cultivation solutions to the world. **Adam Koh** is the Chief Cultivation Officer for 3C. Previously, he served as cultivation manager of a Denver-area medical cannabis facility that was awarded the High Times Cannabis Cup for Best Medical Hybrid in 2014. Koh has experience cultivating more than 100 different strains, including numerous high-CBD varieties, and in his previous position oversaw the care of roughly 3,000 plants at any one time.



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# RIPE FOR CONTROVERSY

Are you deciding when to harvest based on misinformation?

By Kurt and Kerrie Badertscher

**W**hen you think of “ripeness,” you might think of western slope Colorado peaches dripping juice down your chin as you take a bite. Georgia folk would say the same, and that is the point: Most people have had a near-religious experience with a perfectly ripe piece of fruit.

Webster’s defines “ripe” along the lines of the condition of “being brought to full flavor or the best state.” That is a pretty wide definition, but is it safe to say that size, color, texture, juiciness, aroma and taste are all

attributes associated with our idea of “ripeness.”

The term “ripening” has also long been part of marijuana-cultivation practice. When a client ties its production harvest dates to the concept of ripening, decisions that impact the operation’s production output and financial success are being controlled by that concept and are based on opinion and speculation.

Compared to all other inputs for cannabis cultivation, time is everything. The more time spent under the sun/lights, the more the product costs and the longer the period between

harvests. The operation’s total annual production is dependent not only on capacity, but also on the growth cycle. The difference between four and five turns through the flower rooms can be a few days of time spent waiting for “that perfect moment” to harvest.

Seasonal fruit growers may have the luxury of letting apples and peaches ripen a little longer if the weather allows, but more often than not, their market contracts contain a delivery date. Year-round growers, however, must keep crops moving, and delay cannot be tolerated.

Any process that can be delayed by an individual’s opinion is not compatible with a schedule-based business model.

So if by “ripen,” a grower means the time frame where flower colas plump up quickly, or when a plant is flushed, we won’t quibble with that.

We do, however, flinch if the grower follows someone’s eye and experience to set harvest dates. We will ask the grower to describe how they decide when to harvest plants.

The one common trait growers talk about and practice is looking at trichome color. It

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is common for growers to whip out an eye loupe and say they generally wait until 30 percent of the trichomes turn amber before they harvest. Unfortunately, what we do not get from them is an explanation of what the appearance of the trichomes means relative to the plant.

Better taste and smoking, higher potency and “different effects” are what growers tell us they have experienced from waiting until that “right” moment to harvest. What we have not heard is a viable description of the mechanism for rapid changes in flower chemistry.

Naturally, we are drawn to examine how a few days can dramatically change the plant’s chemistry after some 14 weeks of growing.

#### Tomatoes, Peaches and Cannabis

The ripening tomato or peach is quite unlike sinsemilla cannabis. Both the tomato and peach fruits are the result of pollination, and

sinsemilla is the result of lack of pollination. The tomato and peach undergo dramatic changes as the reproductive tissues transform into the seed-containing endocarp and the meaty, juicy carbohydrate-storing pericarp. The biochemistry of fruit is complex.

By comparison, sinsemilla flower masses are pretty boring. The stem of a denuded bud shows us that in the reproductive phase the plant does not change much from vegetative growth, except that intermodal distances grow progressively smaller, creating the tightly packed flower masses. The top of the cola is the apical growing point of that branch and, just as in veg, adds height, as the lower “branches” of the cola continue to lengthen and branch off, adding girth and mass.

In other words, the differences in this plant between veg and flower are not as significant as one might think.

The absence of pollination results in

the lack of initiation of the complex types of chemistry the plant’s genetics have all coded up, ready to produce seeds. So while fruit also undergoes dramatic changes as it matures, with carbohydrates being turned into the familiar sweet sugar of fruit, color changes occur, stems weaken and the fruit falls.

None of those kinds of changes appear to be happening in cannabis. At least at the visible level.

While the cannabis plant does not undergo a ripening in the traditional sense, the question remains whether the plant chemistry is changing during the period leading up to harvest. Again, many believe that waiting for the “right” moment can produce differences in the taste, aroma, potency and smokeability.

For those, like us, who love the medical potential of this plant in particular, it would be a wonderful thing if we really could manipulate

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the chemical content of the plant through cultivation techniques. But chances are that the plant's genetics control the chemistry, and cultivation controls the yield.

Genetic science tells us that a Black Krim heirloom tomato tastes the way it does mainly because of its genetics, its DNA. This is true of all foods. Black Angus seems to be "the" beef

to eat these days, but when you get down to it, steak is steak, and other than controlling feed and maybe better curing, it is always, basically, steak – regardless of the cattle type.

So while the farmer/grower can somewhat modify flavors and textures through their growing and cultivation processes, the basic elements of taste and aroma are locked in

plant seeds and animals.

Only the genetic change that occurs from breeding can change a plant's hard-wiring. This makes it difficult to imagine that anything a grower can do could overcome that programming and force the plant chemistry to change dramatically in relatively short periods of time.

Growers need to focus on lab testing so that decisions are based on a measurable quantity, not opinion. Today, we can test plant chemistry throughout a plant's lifetime and see how the characteristic terpenes, nutrients and cannabinoids change. That is the kind of data on which growers can base solid decisions.

If that information ends up indicating that the plant's chemistry develops and stabilizes fairly early in flower, then there is nothing to wait for late in harvest, and the decision of how long to leave the plant in flower is reduced to an optimization of annual throughput. ✨

**About the Authors: Kerrie and Kurt**

**Badertscher** are co-owners of Otoké Horticulture LLC (OtokeHort.com), and authors of "Cannabis for Capitalists." They have worked with large-scale cannabis producers for more than 5 years. Kerrie has been involved with plants her entire lifetime and earned certification as a Professional Horticulturalist by the 100-year-old American Society for Horticulture Sciences. Kurt brings his 34 years of corporate experience and operations management skills to bear on the business challenges of cannabis cultivation.



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# RESCHEDULING CANNABIS

What would it mean to the future of the industry?

BY SCOTT LOWRY

Currently, cannabis is still a Schedule I Drug under the Controlled Substances Act, a classification that means cannabis has no medicinal value and an extremely high potential for abuse. At the same time, the U.S. Government owns the infamous Patent #6630507, entitled “Cannabinoids as antioxidants and neuroprotectants.”

The patent claims exclusive rights on the use of cannabinoids for treating neurological diseases, such as Alzheimer’s and Parkinson’s, and diseases caused by oxidative stress, such as heart attack and Crohn’s disease.

And now, on the eve of the DEA’s decision on whether or not to reschedule cannabis to a Schedule II drug (said to be done by mid-year, but at press time no decision had been announced), one must weigh the possibilities of whether or not rescheduling the plant to a Schedule II classification would be a positive move for the cannabis industry.

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## The Good Possibilities

“Reclassifying marijuana would make it easier for researchers to work with the plant, which is currently subject to strict limitations and official can be acquired only from a single government garden,” reported *USA Today*.

So that’s a positive, right? Scientists will, for the first time, have a much easier time conducting [and getting funding for] significant research with the plant to document its said medicinal qualities.

Another positive would be that physicians would be permitted to give prescriptions for cannabis to their patients instead of “recommendations.” Currently, doctors can only recommend the drug, since cannabis is still a Schedule 1 and considered federally illegal.

A few more pluses for the industry: Rescheduling marijuana could lift the restrictions of state boundaries, open up the industry to import-export and help increase the potential for a nationwide, regulated market, which we desperately need. Rescheduling could welcome marijuana into the mainstream economy.

## The Bad Possibilities

“Contrary to popular belief, rescheduling doesn’t automatically ease federal criminal penalties, nor would it make the manufacture, possession or distribution of marijuana legal,” wrote *Leafly’s* Jeremy Kossen in a recent article.

There’s still the possibility of arrest. Laws still have to get on the books that change this. [Descheduling cannabis would do that.]

Nor does it solve the conflict between the states and federal government. “Descheduling would be ideal, but ultimately what we need is overall reform of the [antiquated],



non-scientific scheduling system,” said Bill Piper, senior director of national affairs at the Drug Policy Alliance, in the *Leafly* article.

Then there’s Big Pharma.

Big Pharma has a long history of charging exorbitant prices for life-saving medicines. Just look at hated 32-year-old CEO of Turing Pharmaceuticals, Martin Shkreli, who, overnight, jacked the price of a life-saving AIDS drug called Daraprim from \$13.50 a pill to \$750, as *CNN Money* reported.

Then there are “government-granted monopolies” – defined on Wikipedia as “a form of coercive monopoly by which a government grants exclusive privilege to a private individual or firm to be the sole provider of a good or service.”

The government does this to help speed up research and development of new drugs, or as Wikipedia cites, “Advocates for government-granted monopolies often claim that they ensure a degree of public control over essential industries, without having those industries actually run by the state.” But it turns into a financial windfall for the compa-

ny that gets the monopoly if the patented drug is successful.

If said company completely controls a life-saving drug [U.S. Cannabinoid Patent #6630507, say, for example], then they can charge whatever they want for it, and there is little anyone can do about it.

Then there are FDA regulations. “If the federal government determines that medical marijuana must be subjected to FDA approval, companies would have to enter a process that can take years to complete and cost more than \$1 billion per product,” reported *Rolling Stone*. “Few, if any, cannabis companies in the U.S. have the resources for that, which might open the door for Big Pharma to muscle in and take over the business.”

A lot of money is on the line, and when that happens, the people who hold the patents will have a lot of leverage. What happens to the marketplace when companies with tons of resources start throwing their weight around?

The fear that rescheduling would essentially wipe out the existing medical marijuana marketplace that has been established by various states is unfounded, however. As the Brookings Institution explained in a recent article, the plant’s schedule or reschedule is set by the Controlled Substances Act, which is a federal law. The medical programs in existence are legal under state laws.

So does the good outweigh the bad? Reclassification could get us closer to that dream of the mainstream market and new opportunities for sales and growth.

But if cannabis does get rescheduled, I’m going to be looking for who’s holding those patents. Whoever it is will have a huge chance to shape the future of a drug, or multiple drugs, that could save lives. ✱

ILLUSTRATION: © WILDPXEL

**About the Author:** **Scott Lowry** resides in Oakland, Mich., with his wife, five children and their dog, Nora. He is a licensed medical grower and caregiver, and has focused on organic cannabis cultivation for the last 8 years. He also is founder and COO of a large-scale Canadian cannabis production company out of Tecumseh, Ontario, called Global Organiks, which is currently in the application process for becoming a Licensed Producer under Canada’s Medical Marijuana Program. In addition, Lowry is the founder and CEO of GO Engineering, an agribusiness technology engineering company, which creates products for the indoor cannabis cultivation industry. It is safe to say he has a healthy obsession for science, business and all things agriculture.



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# NAVIGATING §280E

With the right tax planning, you can minimize the impacts of the IRS tax code.

By Mario Ceretto

**U**.S. Code § 280E is a (huge) thorn in the sides of all direct participants in the state-legal cannabis industry, refusing tax deductions or credit for any business involved in “trafficking in controlled substances.” But fortunately for

cultivators, with the right tax planning and foresight, a business’s negative impacts from the tax code can be manageable.

Section 280E permits the deduction of cost of goods sold (COGS), but disallows selling, general and administrative expenses unless other lines

of business have been established unrelated to cannabis “trafficking.” Several cases have been heard in U.S. Tax Court, including:

- *Californians Helping to Alleviate Medical Problems, Inc. v. Commissioner of Internal Revenue*, May 15, 2007.

- *Olive v. Commissioner of Internal Revenue*, Aug. 2, 2012.

These cases have clarified what constitutes “trafficking” (supplying marijuana products) and has enabled accountants to better help their clients identify those costs within their businesses, as well as identify other



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expenses that clearly are necessary to the business and not related to “trafficking.” The cases also stressed the grave importance of having accurate books and records, and being in compliance with 280E, at the risk of penalties and fines.

The first step in tax planning for any business is choosing the best entity type to establish. This step alone can be one of the most important in the process, but it is often ill-advised. For cannabis-industry professionals, LLCs are a preferred entity type due to their less-restrictive operating formalities and flexibility through customized operating agreements. In an environment where outside investment is frequently sought, LLCs are attractive in that the business manager/owners can maintain control and establish ownership percentages irrespective of contribution values by investors.

Another important consideration for the grower is regarding land and real estate.

With the risk of federal asset forfeiture, it makes sense to separate the cannabis-touching entity from the land being cultivated. For a grower who currently owns the land being cultivated, the first entity structuring plan is to place the land in a limited liability company (LLC) that will act as a property management holding company. The next step is to form a second LLC for the purpose of cultivating the land and leasing the property from the holding company.

### Why Are LLCs Optimal?

An LLC is a flow-through entity such that net profits (and losses) pass through to member owners based on the allocation percentage that is specified in

the operating agreement. With 280E, growers can deduct a majority of their expenses as cost of goods sold (COGs). For a grower, the point at which 280E applies is when the product has been harvested, bagged, sealed, and activities are being performed to “traffic” the product to customers. The “trafficking” costs disallowed under 280E include, but are not limited to: advertising, website, telephone and communications, delivery and sales force.

**About the Author:** Mario Ceretto is the founder of New Era CPAs, LLP, and has been helping clients in the cannabis industry with litigation support, compliance, 280E strategy, and tax preparation for over six years. He has spoken at numerous cannabis and accounting events. Ceretto holds CPA certificates from the State of Oregon and State of California.



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An LLC is a “flow-through” business entity – so it passes income/profits on to the member owners. In other words, LLC member owners are personally responsible for their taxable flow-through income from the partnership. Due to this “flow-through” nature, it may be best to elect to be taxed as a corporation instead of an LLC. If you choose to be taxed as a corporation, the operating formalities of the LLC will remain intact, and 280E exposure transfers from the shareholders to the entity. Therefore, the shareholders are not held personally responsible for their partnership’s tax liabilities.

**The Accrual Method of Accounting**

The *accrual method* of accounting is the best choice for all cannabis-touching businesses – particularly growers. Since COGS is an

allowable expense under 280E, the accrual method of accounting is the only viable method that allows for *absorption costing* – the process of identifying indirect production costs and allocating them to inventory. Advertising is certainly not an inventory cost. However, trimmers and the area where they are used are.

This tax-planning technique must be addressed up front, as the accrual method needs to be elected on the first tax return filed by the entity. If it’s not, then the business will need to apply for special permission from the IRS commissioner to make the change.

As COGS is the only deductible expense on the federal tax return, it’s imperative to take these planning considerations seriously from the outset. Always consult your tax and legal professionals for the best guidance for your business. ✨

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# END NOTES

Quotes you should note



“Let me just be frank. I fundamentally believe that **the war on drugs in this country and around the world has been a monumental disaster.** It’s been a disaster in public health terms. It’s been a disaster in public safety terms. It’s been a disaster in fiscal terms and a disaster in human rights terms.”

**Ethan Nadelmann**, executive director of the Drug Policy Alliance, at a Homeland Security and Governmental Affairs senate committee hearing examining alternative approaches to the war on drugs.

Source: *Cannabis Business Times*



“It’s like trying to sell cars, but only having **one at a time** and you can’t get another for two or three months out.”

**Nate**, owner of FiveLeaf Organics in Montana (requesting anonymity), about the 2011 Montana Marijuana Act, which limits the amount of patients a provider can have to a total of three. The U.S. Supreme Court refused in June to hear an appeal of the case.

Source: *Flathead Beacon*



PHOTO COURTESY OF ALLEN ST. PIERRE

“**Allen deserves and ... will receive great credit** when people write the history of this movement.”

**Kevin Oliver**, executive director of NORML’s Washington chapter, on national Executive Director Allen St. Pierre, who resigned July 15. Pierre has been the face of the organization since 2005.

Source: *Cannabis Business Times*

“When children eat this, it can make them very sick because it contains marijuana - **which is a drug.**”



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Suggested age-appropriate language for children about edibles from the Washington Poison Center, which recently unveiled its new child warning sticker [right]. In 2015, the center received 272 calls for children exposed to marijuana, according to a center press release.

Source: *Washington Poison Control*

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