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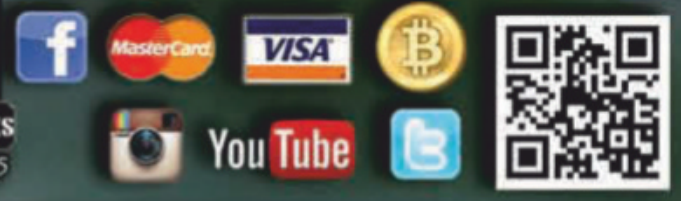
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“Your hydroponic setup can be as complicated or as simple as you like—it’s up to you. The flexibility of hydroponics is one of the main reasons it’s so effective and popular.”

Hydro Methods—page 78

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Mila Jansen entered the male-dominated world of cultivation and hashmaking and became a cannabis icon and world-renowned hash expert. Learn how Mila became the Hash Queen and forever changed the cannabis world. *By Cassandra Purdy*

55 A BEGINNER’S GUIDE TO CBD

CBD is everywhere right now but how does it work? Can it really provide relief? Our guide breaks down everything you need to know about the ultra-popular cannabinoid and how it can help you. *By Jessica Delfino*

62 THE REBIRTH OF SUBCOOL

The man behind some of the world’s best cannabis genetics is back and better than

ever. Get the inside story of the rise and fall of this legendary bud breeder and his dank triumphant comeback. *By Danny Danko*

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Growing hydroponically can lead to explosive growth rates and huge yields, as well as other benefits that come with cultivating cannabis without soil. Find out which hydro system and growing medium is right for you. *By Thomas Valentine*

89 EXPERT LIGHTING ADVICE

The right lighting can take your grow to the next level, increasing potency and yield. SANlight founder Martin Anker explains what to look for in a grow light and offers tips for a heavier, headier harvest. *By Stoney Tark*

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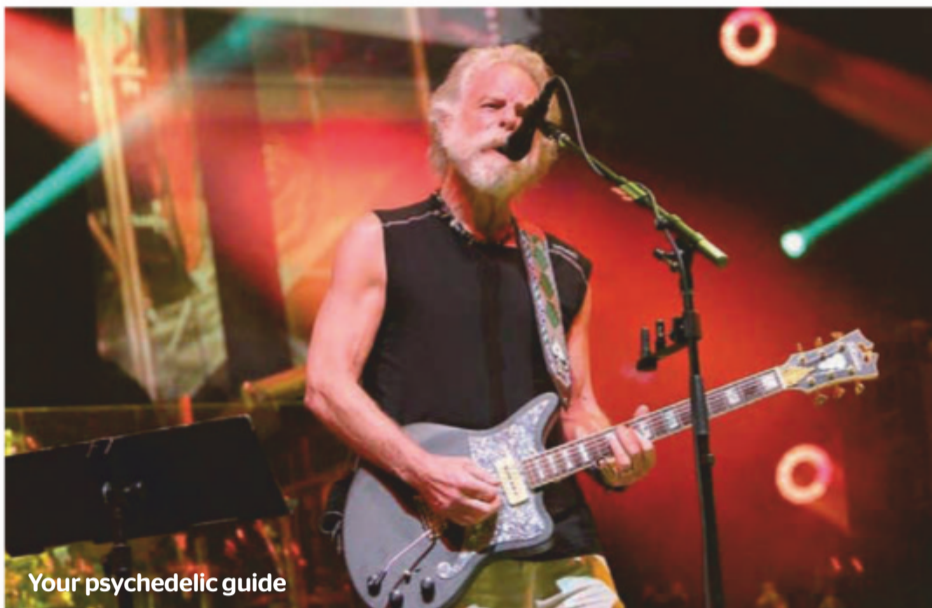
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TRIPPING WITH BOB WEIR



Your psychedelic guide

For 50 years, Grateful Dead co-founder Bob Weir has been at the forefront of psychedelic experimentation. And if you thought perhaps age or the rigors of constant touring have slowed him down, well, you'd be wrong. Bay Area-based author Daniel Levitin ran into Weir at a Northern California restaurant one evening and, after discussing the therapeutic potential of certain psychedelics, was invited back to Weir's home to 'shroom. What followed

was a remarkable trip that allowed Levitin to connect to and commune with nature. And, luckily for us, Levitin provided an account of the evening for High Times. So, if you ever wanted to know what it is like to do mushrooms with legendary musician and psychonaut Bob Weir—or you'd just like to learn a bit about the transformative powers of magic mushrooms—head to hightimes.com and read all about it!



FIGHT BREAST CANCER

Cannabis has long been used by cancer patients to help treat the side effects of chemotherapy as it is very effective at preventing nausea and stimulating appetite. And, while more research is necessary, pot has even demonstrated the potential to reduce tumors. Cannabis is an important ally in the war against cancer and now High Times is joining the fight. We're encouraging everyone to show their support for breast cancer research with our new pink pot leaf pins. These small, metallic pins are the perfect way to demonstrate your support for this incredibly important cause. They cost \$5 and, most importantly, all proceeds from the pot leaf pins will go to the Breast Cancer Research Foundation. Head to hightimes.com to learn more about the campaign and help fund breast cancer research.

ON INSTAGRAM

While we've all become accustomed to extracts created by solvents, hash was originally created by rubbing the cannabis plant until a tacky ball of resinous gland heads formed. It's easy to imagine that process while looking at this photo of extremely sticky Sundae Driver. Gloves are necessary as this bud is positively dripping with resin. This supreme strain was grown by @max_herbals and selected by @black_sheep_farmers. Give them both a follow for more pics of mouthwatering pot. And learn more about the history of hashmaking in our feature "The Hash Queen," on page 44.



WE WANT TO HEAR FROM YOU!

Tweet your best high observations and comments our way (@HIGH_TIMES_Mag) for a chance to be featured on this page! And be sure to follow us on Facebook: (Facebook/HighTimesMag) and Instagram: (@hightimesmagazine) for all the latest news as it's happening!

@BillRee20561495: @HIGH_TIMES_Mag All plants love the Sun. It makes outdoor-grown weed happier than indoor-grown weed. That happiness shows itself in the final product.

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@christmas_scott: @HIGH_TIMES_Mag Please please legalize!!!! I have dealt with this ridiculous plan to keep weed illegal for over 35 years ... It just makes no sense! The penal system has made enough \$\$\$\$ off of peoples bad luck getting caught...

@MANNYMAC2K11: @HIGH_TIMES_Mag How is it that pot is still not legal in the state that smokes the most. come on NY... what do you mean there ain't enough \$\$\$\$ in the budget

@GroovyGarden420: @HIGH_TIMES_Mag Sexing the plants was the biggest challenge I faced on the first grow. Followed by learning how to measure EC/ppm and pH appropriately for both feeding and monitoring runoff values.

@Foats25: @HIGH_TIMES_Mag Reefer Madness!!! Stop the insanity!! Florida is lame.

@LisaChr13776761: @HIGH_TIMES_Mag Why are there so many stipulations when dealing with Cannabis? It's a prejudice against the people who enjoy it and to all the patients who need it for very serious issues. How can anybody judge the bud w/o trying the Bud? Another example of no common sense.

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Subcool is back to doing what he loves.

THE REBIRTH OF SUBCOOL

I FIRST ENCOUNTERED the cannabis seed breeder known as Subcool on the *overgrow.com* forums in the mid-2000s. He was knowledgeable and helpful to newbies, and he provided rare American-made genetics to the general public. I chose his Jack the Ripper strain as one of the *High Times* Top 10 Strains in 2006 and entered his seed company into our *High Times* Seed Bank Hall of Fame in 2009.

The following decade wouldn't be so kind to Subcool. He was diagnosed with a devastating hereditary lung disease, and he suffered the one-two punch of losing his life and business partner to separation and the destruction of his home and all of his possessions in a fire that almost took his life. But Subcool rose from the ashes and put his life and business back together, and he's now happier than ever with his new seed venture called the Dank.

Subcool even recently told me that he's glad that his house burned down. It gave him a fresh start and the kick in the ass he needed to change his life for the better, and he really does sound much happier these days. It just goes to show that sometimes in life the things that we fear the most are the ones that have the power to transform us into a better version of ourselves. Learn more about his harrowing tale of life after near-death on page 62.

Also in this issue, we examine the different hydroponic systems, techniques and mediums to choose from for soilless growers. We also provide a CBD explainer that's the perfect guide for beginners who want to learn more about the medicinal properties of cannabidiol. Along with that, we interview a lighting expert who can improve your grow, and we have a feature profile on the Hash Queen, Mila Jansen, discussing her life, travels, new book and her hashmaking inventions that changed the world of cannabis concentrates forever.

So sprinkle some tasty hash into a joint, fire it up and start reading!

Danny Danko
SENIOR CULTIVATION EDITOR

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CONTACT HIGH

HYDROPONIC METHODS Growing cannabis plants without soil requires understanding the fundamentals of hydroponic farming. Learn all about the variety of mediums, systems and techniques needed to start your own soil-free ganja garden on page 78. *Photo by Justin Cannabis*



CONTACT HIGH

BEGINNER'S GUIDE TO CBD CBD is enjoying mainstream popularity but what exactly does it do? How can it help? This month, we're explaining CBD and providing everything you need to know about the *it* cannabinoid. Find out if you could benefit from CBD. Learn more on page 55.





CONTACT HIGH

MASTER BLASTER Here at *High Times*, when we pack a bowl, we really pack a bowl! This Master Blaster strain from Purple Frost genetics is a hybrid with high levels of the terpenes myrcene, terpinolene, and limonene. This variety makes for a wonderful daytime smoke by stimulating intense conversations, making it perfect for socializing. *Photo by Justin Cannabis*





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HIGHWITNESS NEWS

**MATTHEW
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ON SET!**



NEWS

DOG DAZE

Drug-sniffing dogs face an uncertain future in states that have legalized cannabis. p.26



ENTERTAINMENT

HIT THE JAY

Former NBA player Matt Barnes is advocating for pot in his post-playing days. p.32



Weed brings in the bucks.



IT'S THE ECONOMIES, STUPID

POLICYMAKERS ALL OVER THE WORLD CONSIDERING LEGALIZATION HAVE A POWERFUL INCENTIVE TO GET IT DONE: COMMUNITIES THAT FREE THE WEED ARE REAPING BEAUCOUP BENEFITS THAT FLOW FROM REVITALIZED ECONOMIES. BY MIKE DIPAOLA

YOU MAY HAVE heard about the impressive jobs numbers in the cannabis industry. The latest: There are now 211,000 full-time weed jobs across the United States, with a robust 64,000 or so added in 2018 alone. Since the US government doesn't keep track of such things, and probably won't so long as cannabis is illegal at the federal level, Leafly and

Whitney Economics have painstakingly "gone state-by-state to tally the total number of direct, full-time jobs in the state-legal cannabis industry."

The numbers are staggering. In pioneer states like Colorado and Washington, job growth is beginning to level off, but newcomers to the game such as Florida, with a young medical-pot

program, saw leaps in cannabis employment by a whopping 703 percent last year, adding more than 9,000 full-time jobs. Pennsylvania and New York, neither of which had even legalized for adult use, added nearly 10,000 jobs in 2017.

Communities around the United States and beyond are seeing the economic benefits of legalization, which is increasingly seen as a driver of revitalization in depressed places. The optics are often dramatic. Consider a business like OrganiLife, a medical-pot facility that makes its home in a former meatpacking plant in Chesaning, MI. For nearly a quarter century, that plant sat dark and abandoned; now it's a flourishing weed cultivation and processing facility, brimming with life in a 30,000-square-foot space with plans to expand further yet.

Michigan became the 10th state to legalize weed for adult use, so reenergized sites like the one in Chesaning could be a sign of things to come. There is ample evidence that economic transformations are also happening on larger scales than just one defunct factory. Consider Pueblo, CO, a city of 100,000 that was, like a lot of places, impoverished and saddled with a high unemployment rate following the collapse of its steel industry. Today, its cannabis cultivation and processing businesses are hopping.

This is not to say that Pueblo has solved all its economic issues or that the cannabis industry can work miracles everywhere at all times. For example, some observers say that pot advocates overstated the economic promise of legalization in places like Coalinga, a small town in California's Central Valley that drew early cannabis investors and businesses. The *Nation* dismissed the young industry as "a bust," saying Coalinga was one place where "the promise of legalized cannabis has failed to deliver."

To be fair, it's too early to grade Coalinga. When the town got its first infusion of weed bucks—Ocean Grown Extracts bought the town's vacant prison for \$4.1

« million—it used much of the cash to pay off its debt. This is a town that had long ago lost its oil industry, was slammed by an earthquake and suffered through some brutal drought years. The War on Drugs had filled Coalinga’s two prisons, but they were eventually shut down as well; now the end of that war could fuel the town’s renaissance. Give it time, because the nascent weed business has given Coalinga a pulse.

Around North America, communities are coming to life in the green revolution, and policymakers in not-yet-legal jurisdictions are taking notice. Take the small Canadian town of Smiths Falls, which was a chocolate-making mecca until Hershey shut down its plant in 2008, taking jobs to Mexico. Then cannabis giant Canopy Growth came to town in 2014 with five employees. Five years later, there are more than 1,000 workers gainfully employed, with 50 to 100 new hires added every two weeks, according to the *Binghamton Press & Sun-Bulletin*. The 450,000-square-foot former chocolate factory occupied by Canopy Growth will soon double in size, making room for more grow space and more economic

Around North America, communities are coming to life in the green revolution, and policymakers in not-yet-legal jurisdictions are taking notice.

growth. “There’s a new skip in our step,” declared Smiths Falls Mayor Shawn Pan-kow. “It’s been a complete shift. We got our swagger back.”

South of the border, Binghamton, NY, has been watching this economic turnaround with envy and approval. In 2002, IBM left Binghamton, taking with it jobs and revenue. Like Smiths Falls, Binghamton is looking to cannabis for economic renewal. The upstate New York town and its environs have attracted investors in industrial hemp, including some of that Canopy Growth cash.

Around the world, cannabis-curious locales are using the economic-revival argument to bolster the case for legalization. Countries in the Caribbean that are working on medical-pot programs—Bermuda, Antigua and Barbuda, and Saint Kitts and Nevis, among others—are

doing so largely to inject some life into their respective economies. So it goes in Africa, Southeast Asia and elsewhere.

Senators in Guam, a US territory in the Pacific, recently voted to legalize, the objective spelled out in the opening line of the legislative bill: “the interest of enhancing revenue for public purposes with the creation of a new industry.”

Marijuana is a miraculous plant, but as a medicine it does not cure everything. Similarly, the marijuana industry can bring extraordinary growth and energy to economically depressed communities and countries, even if it cannot address every economic need. Advocates tout the revitalizing qualities of the cannabis industry for a simple reason: All the evidence shows it’s working. ✨

HIGH FIVE BY FRANK GREGORY

STATE BY STATE

FIVE GOVERNORS ON RECREATIONAL LEGALIZATION.



NEW YORK

Andrew Cuomo steadfastly opposed legalized weed until 2014, when he grudgingly allowed medical use (while highly restricted). He then announced support for legalization in December 2018 after being pressured during the gubernatorial primary. Under the adult-use plan, marijuana would be legal for adults over 21. Cuomo is proposing a 20 percent state tax and 2 percent county tax on marijuana transfers from wholesalers to retailers, in addition to a \$1-per-gram tax on flower for cultivators. The gov is allowing opt-outs for large cities and counties.



NEW JERSEY

Phil Murphy has advocated for legalization for quite some time. His deal with the State Senate and Assembly would set up an expedited record-expungement process for people convicted of low-level pot crimes. The measure also aims at encouraging pot-industry participation for minorities and women. Whereby previous proposals called for phasing in an escalating sales tax on marijuana, the deal calls for a set \$42-per-ounce tax on the product. It also lets towns collect tax revenue, as well. Everyone is getting a piece of the action!



PENNSYLVANIA

Tom Wolf, a former opponent of adult use, recently changed his tune, saying the state should take a serious look at it. On July 19, 2018, the state’s auditor general, Eugene DePasquale, released a report projecting that Pennsylvania could generate \$581 million per year if it regulates cannabis for adults 21 and older. In October 2018, the Pennsylvania House Judiciary Committee approved a decriminalization bill, but the State Legislature adjourned in November without putting it to a vote.



CONNECTICUT

Ned Lamont has established legalization as one of his priorities in 2019. It was part of the platform he campaigned on in the 2018 election. “It’s something I would support, and I don’t want the black market controlling marijuana distribution in our state,” Lamont proclaimed. Lamont put forward the idea of using tax revenue from recreational-cannabis sales towards stronger opioid-treatment measures. A poll earlier this year indicated 59 percent of Connecticut voters support cannabis legalization.



MAINE

Maine is dragging its feet in implementing rec-pot sales. Of course, former Governor Paul LePage being an unwavering opponent of marijuana didn’t help. The voters approved legalized weed in 2016. Recently, legislators overrode LePage’s veto of cannabis-legalization legislation, finally setting the path to the legal sale and production of recreational cannabis. Implementation of sales has had delay after delay. The next target for commencing regulated sales and a tracking system is this spring. Stay tuned.

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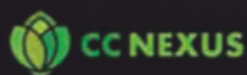
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Rest in peace Nevil.

RIP NEVIL SCHOENMAKERS

The cannabis world lost a pioneering legend when Nevil Schoenmakers passed away on March 30, 2019. Australian-born to Dutch parents, Schoenmakers, along with just a small handful of others, jump-started the entire cannabis seed-breeding industry. He was also the first seed breeder to advertise in *High Times* in the early 1980s. His seeds launched countless grow operations around the world, and his Nevil's Haze is still a staple in many gardens and breeding efforts.

In the darkest days of the War on Drugs, Schoenmakers's distribution of viable cannabis seeds from Holland was an overtly political act and an attempt to quite literally "overgrow the government." Many of the strains we consume today are hybrids of that original genetic material that he bravely shared with the world at great risk to his own freedom. Schoenmakers was relentlessly hounded and harassed by law enforcement at every level. His legacy lives on in the gardens of thousands of legal and clandestine cultivators around the world.

CHEM TRAILS

Colorado's Institute for Cannabis Research is doing something that no one wants it to do: use taxpayer money to develop a seed-to-sale tracking system that would involve adding a chemical or some such substance to the plant. The *Denver Post* reported that such a tracking system has already been rejected by the State Legislature "primarily because the state's marijuana industry loudly told them they don't want to add a foreign substance to their product." Critics also object to the fact that the institute, which is part of the Pueblo campus of Colorado State University, is essentially doing R&D that will be used by the private sector. The *Daily Sentinel* tried to obtain information about the research, but was rebuffed by the school, which doesn't disclose detailed info on ongoing research. The institute did say in an email that it was looking into a tracking system that involved embedding an isotope into a plant after germination, thereby making it possible to track products derived from it back to its source.

INSIDE THE WIDE WORLD OF WEED



Tokes between takes

MOVIE BUDS

Snoop Dogg and Matthew McConaughey were on *Jimmy Kimmel Live!* recently, plugging their new stoner film *The Beach Bum*. The lads apparently had a great deal of fun on the set, as evinced by one anecdote in which Snoop slipped some real chronic, i.e., "Snoop Weed," into a joint that was supposed to be filled with prop oregano. In a take that took about eight minutes to film, McConaughey got quite blitzed. "I didn't say another word of English, really, for the rest of the night," the actor said. "You said I rapped a lot." To which Snoop responded: "You rapped for 13 hours straight!" While that sounds unpleasant, it's clear the actors enjoyed themselves throughout the making of the film, which chronicles the misadventures of the stoner-poet Moondog (McConaughey) while Snoop Dogg plays Ray (short for Lingerie), Moondog's dealer. So there was some method acting to the madness, it would seem.



Nosy narc

DOG DAZE

Drug-sniffing dogs face an uncertain future in states that have legalized cannabis. Most are trained to nose in on multiple substances—coke, heroin and, of course, weed—but once they learn to identify a drug, they can't unlearn it. That's why the K9 officers in places like Berrien County, MI, are no longer trained to

find cheeba, according to the *South Bend Tribune*. Voters in the Wolverine State decided last November to legalize it for recreational use, and so weed-sniffing police dogs may be facing the unemployment line. David "Lou" Ferland, executive director of the United States Police Canine Association, said police dogs might have to retire early if drug detection is their only jam, but most dogs can do other things, like track suspects. "I don't know of any police dog that has been retired out prematurely simply because it's trained to detect marijuana," Ferland said. This year, more than half of the state's 36 narcotics dogs are retiring because of age, and their replacements will be trained to sniff out meth, smack and coke, but not weed.

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CHEW GOT THIS

A Humboldt County company has come up with a new twist on a classic delivery system: the chew. Cannadips pouches are infused with CBD or THC, and are consumed much the way one would consume a chaw of tobacco, minus the disgusting part. “Our pouches are smokeless, spit-less, and non-visible, giving patients the versatility to medicate when they want, where they want,” plugs the Cannadips website. Company co-founder Case Mandel explained it this way to *Green Entrepreneur*: “When you put the product in your mouth, it gets absorbed under the tongue and into the back of the mouth, where there is the buccal artery. We believe this causes it to go directly to the brain and bypass the liver completely.” We don’t yet know how this measures up versus edibles, other than that it works faster. “There is some small level of the delayed absorption, but, unlike edibles, our product is rapid acting,” Mandel added.

BLUNT RESIGNATION

Shortly after Dallas Cowboys defensive tackle David Irving was suspended for violating the NFL’s drug policy (again), he took to Instagram to end his football career. “Basically, guys, I quit,” Irving declared with a broad smile in a 17-minute video, as he torched up a blunt and expounded on his suspension, the “bullshit” he and other players have to put up with in the league and the healing benefit he derives from cannabis. “Everyone needs to relax, calm down, smoke one.” A few weeks after his blunt announcement, Irving appeared on *Tiki and Tierney*, a CBS Sports Radio show, to talk about the league’s dopey regs. “Eighty percent of each team participates in the use of medical marijuana, if not higher,” Irving said. “It’s literally our jobs to get concussions every single day. We’re going to get hurt, and then they offer us opioids. I don’t agree with that.”



Confiscated conflagration

BURN NOTICE

The Drug Enforcement Administration (DEA) wants you stop asking it for a job burning its confiscated marijuana. The increasingly irrelevant federal agency felt the need to make a public statement to that effect following its announcement seeking a contractor to perform this wanton act of combustion. The DEA’s Houston branch needs a big-time destroyer to gather up weed confiscated in several Texas cities, then cart it to Tucson, AZ, for the big burn—a conflagration big enough to blaze through a thousand pounds an hour, eight hours a day. Following news reports of the job announcement, the DEA was flooded with job applications, so it took to Twitter to quell the enthusiasm. “Several recent misleading articles alleging #DEA Houston is looking for Houstonians to burn Marijuana have resulted in an influx of calls from citizens,” the Houston-based narcs tweeted. “This solicitation was targeted for a large scale licensed vendor, not private citizens.”



A club for high society

MEMBERS IF ONLY

A pop-up for an upscale, elitist cheeba club appeared on the Lower East Side of Manhattan recently, raising questions about what sort of gated hellscape the filthy rich have planned for their piece of the cannabis space. It turns out that “Country Club Cannabis,” with its formal dress code and

snobbish entry requirements, was a ruse, a hoax concocted by the Drug Policy Alliance to bring attention to the inequities that a poorly designed legalization regime would create. Specifically, the faux-exclusive campaign is intended to spur New Yorkers to urge Governor Andrew Cuomo to make sure that expungement of criminal records and minority participation will be part of the coming legalization policy. Among other things, any tax scheme should direct revenue to communities acutely harmed by the War on Drugs. In other words, cannabis reform in the Empire State should be emphatically inclusive, the precise opposite of a country-club vibe. For more info, see drugpolicy.org.

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 SIGN UP





Now retired from the NBA, Matt Barnes is free to light up.

HIT THE JAY

FORMER NBA PLAYER MATT BARNES EXTOLS THE VIRTUES OF CANNABIS. BY MICHAEL GRIEGO

A SYMPHONY OF car horns echoes along Sunset Boulevard as traffic inches past a modern boutique hotel—the location in which former Laker and NBA champion Matt Barnes sits poolside, prepping his afternoon smoke. Being around the six-foot-eight former power forward, it becomes increasingly apparent that retirement for Barnes doesn't mean being idle—it means hustling in a number of different industries, including the cannabis sector.

Leaving the NBA has been freeing, Barnes explains as he pops open a black doob tube and slides out a king-size Blue Slush joint. He lights up with ease. Raw rolling papers—one of his sponsors—lighters and jars of vibrant eighths clutter the table. Because Barnes doesn't have to undergo any more league-imposed drug tests, he can actively advocate for the herb—and elaborate on his new role in the cannabis space.

“[Seven Leaves] has really great weed,” he explains. “I knew there had to be a way for us to work together.” The Sactown startup was founded in 2016 and claims to produce some of the healthiest and

purest medicine grown west of the Mississippi, boasting strains like Bon Bons, Blue Slush and Cookies & Cream.

Seven Leaves co-founders Michael B. and Tyler K. recruited the help of the former Sacramento Kings forward, bringing Barnes on as a brand ambassador—and soon-to-be part owner. Barnes says he feels he can help bring national exposure to a small brand that's doing cannabis right.

“It's a small company out of Sacramento, my hometown,” Barnes says. “With a bunch of great guys running it, I wanted to do everything I could, to help them grow and hopefully put them on a national scale.”

Barnes now has an exclusive line of pre-roll joints under the Seven Leaves brand. And the name of each strain corresponds with the appropriate time of day to consume it: Wake and Bake, Post Workout, Happy Hour and Loaded Dreams. The collection mimics his daily smoke cycle, which begins when he wakes up and ends after his kids fall asleep. In essence, the line is designed for all-day smokers who have busy schedules to maintain.



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Barnes is currently a brand ambassador for Sacramento-based Seven Leaves.

Barnes says he smokes for an array of reasons, including staying focused, rejuvenating after a workout and drifting into a dream state. He began smoking in his teenage years and has continued well into retirement. He explains that his consumption is the reason he's able to have a dedicated family life alongside a thriving business—even after navigating the hardships and physical pains of a robust athletic career.

"I've been smoking since I was 14," Barnes says, "all through high school, college, and all through the NBA. I really had to jump through a lot of hoops and dodge fireballs in order to stay above water. My whole life was stressful and tough, and I also have athlete-level body pain, which [I'll have] for life, and weed has always gotten me to where I needed to be, along with helping me stay levelheaded."

Barnes isn't the only former professional athlete with this sentiment. Mike Tyson, Kyle Turley, Joe Montana and Ricky

"Now that [Barnes is] out of the NBA, his objective is to normalize cannabis for the mainstream, proving that people who use cannabis are good, responsible citizens."

Williams, to name a few, have also jumped into the green rush, post-career. They're some of the industry's leading advocates for cannabis use among athletes.

"At the end of my career, I really wanted to become an advocate for cannabis and let people know it's not everything [the government] says it is," says Barnes. "The more we educate people, the more they'll understand that."

That's why Barnes—who's played for UCLA, the Lakers and the Golden State Warriors—is not intimidated by the public's perception of his herbal use. And now that he's out of the NBA, his objective is to normalize cannabis for the mainstream, proving that people who use cannabis are

good, responsible citizens.

"It's about being honest with the public," Barnes says. "I do have to be careful the way I word things. I have kids and coach them through all their sports, so I don't want to just be yelling, 'Smoke weed, smoke weed.' So my whole goal is taking the 'high' part away from the message and give people the educational and beneficial side of why I smoke."

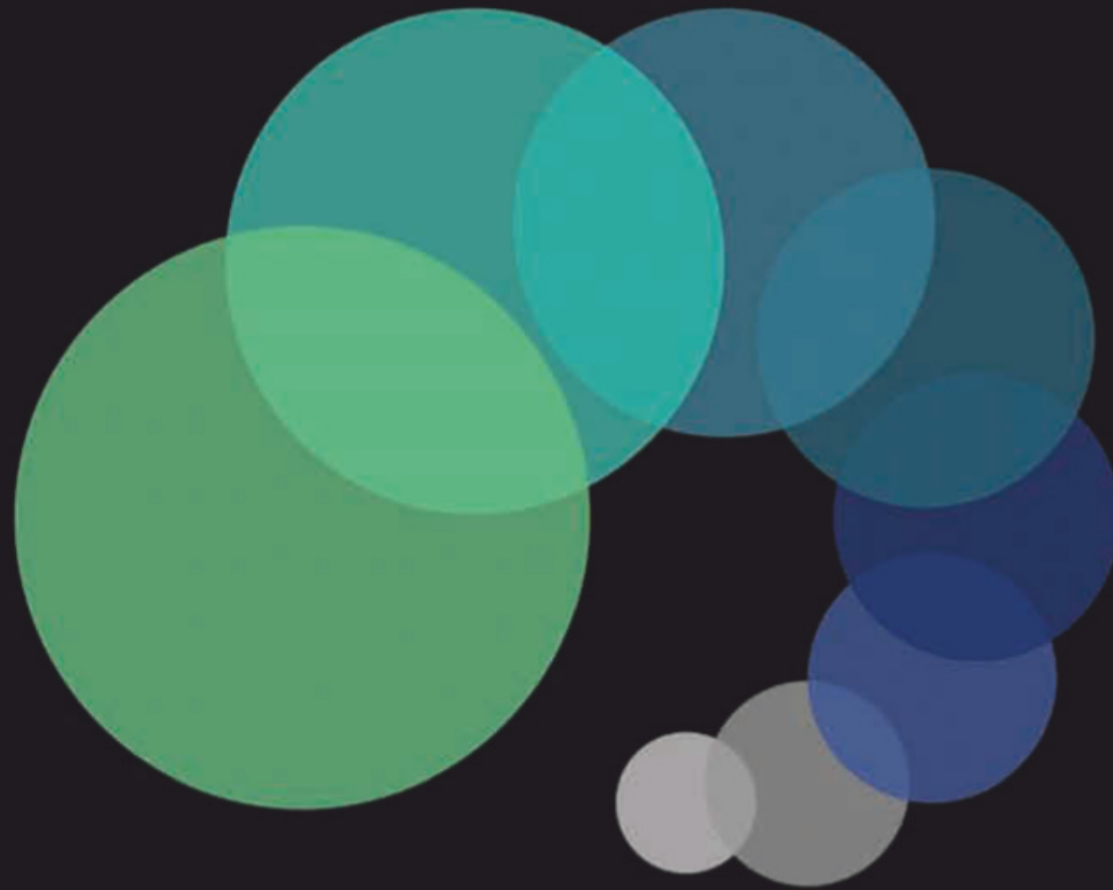
Although Barnes smoked throughout his professional career—even failing a pair of drug tests for THC—he says he was never high on the court. But cannabis was an integral part of his routine, even on game day. During the season, Barnes explains he'd get up and shoot hoops around 1 a.m. He'd get

back home by noon, smoke and take a nap. He'd then get up, eat, shower and get ready to play.

"I never got high on the way to games," Barnes says. "But I was always someone who played through injuries—there was always something hurt. So after practice, I would smoke a joint and it would help me sleep, help the pain go away, and I would just be focused... I was never, and am still not, disrespectful with [my consumption] or crazy with it. There was always a time and place."

While cannabis was once a source of tension in Barnes's career, it's now a source of his greatest freedom. "Before you pass judgment, educate yourself and understand what this plant can do for you," Barnes says, sparking up another joint. "Smoking might not be for everybody, but I guarantee, if people understood the plant from head to toe, [they'd know that] a piece of that plant can help people, even children." ✨

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EMANCIPATION IS COMING FOR THE CANNABIS CONSUMER.

J.J. McCoy is Senior Managing Editor for New Frontier Data



“YOU’VE COME A long way, baby.” Fifty years ago, that classic advertising slogan from the Leo Burnett Agency caught fire with Philip Morris’s ad campaign for Virginia Slims, pitched as the first cigarette brand specifically marketed to women. It captured the feminist zeitgeist for liberated women, throwing off the repression of politesse, discrimination, sexism and inequality.

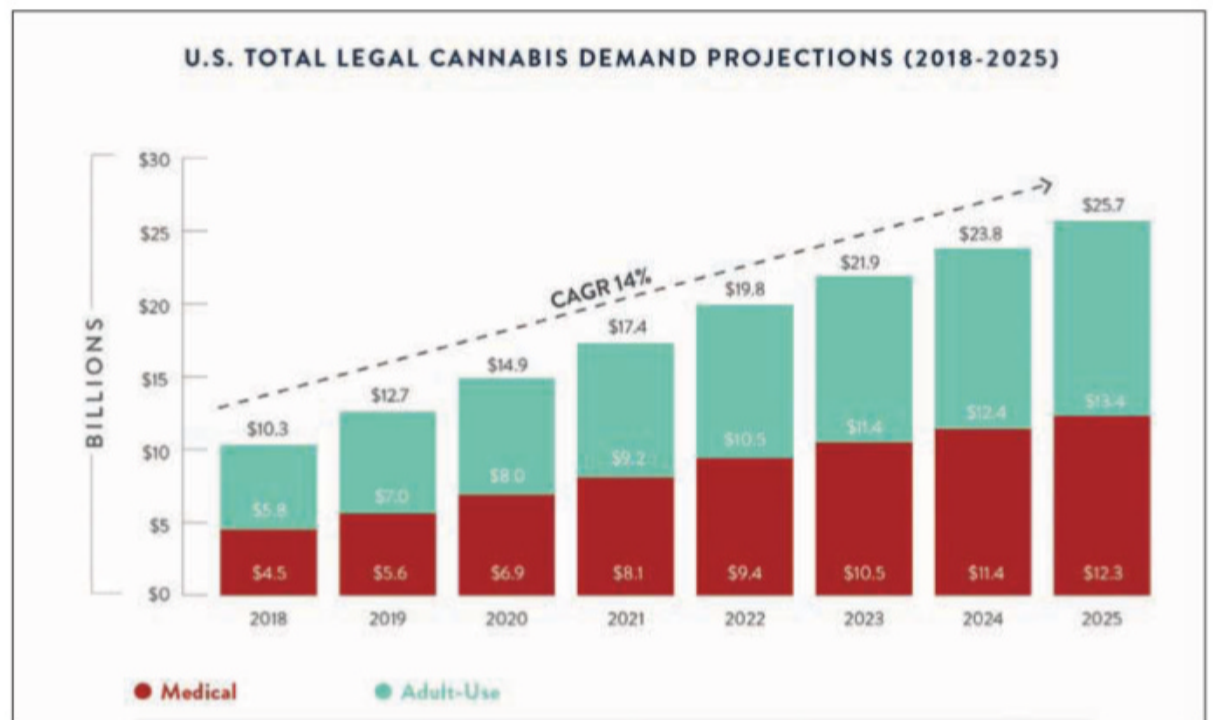
While equating tobacco with freedom seems an anachronistic notion ever since the outing of Brown & Williamson and the corporate fat-cat “nicotine is not addictive” scandals of the 1990s, there are nevertheless some social parallels to be considered between the rise of feminism and the sexual revolution in the ’60s as juxtaposed with today’s increasing enthusiasm for cannabis reform.

The first recorded instance of cannabis prohibition in the United States was established in 1906, in the nation’s capital, under “An act to regulate the practice of pharmacy and the sale of poisons in the District of Columbia, and for other purposes.”

Now, of course, after more than 20 years since California first legalized cannabis for medical use, the reform movement has seen such programs established in 33 states and the District of Columbia, while 10 states and DC also have regulated adult-use programs.

As Thomas Paine noted during an altogether different revolution: “Government, even in its best state, is but a necessary evil; in its worst state, an intolerable one.” The populace may be taking heed again, though the popularity of cannabis is by no means limited to the United States. In fact, while the US federal government has remained stubbornly slow to adopt nationwide reform policies, Canada to the north opened a nationwide adult-use market in October 2018, and Mexico’s highest court ruled definitively that its citizens have the fundamental right to possess cannabis for personal use.

Survey results released this past spring by the Associated Press–NORC Center for



Public Affairs Research and the General Social Survey found increased support for legalization across all demographic age groups and political parties. It also marked the first time since the annual survey began in the 1970s that a majority of Republicans supported legalizing cannabis, 54 percent (up from 45 percent in 2016). Among Democrats, 76 percent favored legalization.

As reported in New Frontier Data’s “2018-2019 Cannabis Consumer Report: Archetypes, Preferences & Trends,” the top three reasons cited by consumers for using cannabis are for relaxation (66 percent), stress relief (59 percent) and anxiety reduction (53 percent). However, smaller percentages use cannabis for other reasons, including improved sleep, medical treatment, social enjoyment or stimulated creativity.

Propelled by ever-increasing social acceptance, expanding markets and large waves of investor capital, the legal cannabis industry is poised for significant growth in the years ahead. As it grows in size and complexity, it also becomes ever more important that operators (and public-policy decision makers) understand who cannabis consumers are and the influences motivating their behavior.

The legal use of cannabis for medical applications is now sanctioned in more

than 50 countries, with cannabis-derived products medically approved for more than two million patients in the United States alone. Cannabis is being used as a treatment option for diseases and conditions ranging from Alzheimer’s to epilepsy, opioid addiction and some forms of cancer. Evidence is being continually gathered and updated, to the point of now suggesting that the benefits of cannabis can extend against opioid-related deaths and the economics of health-care spending.

Cannabis consumers are reclaiming what had—up until 82 years ago—been considered a birthright. The year after Woodrow Wilson began his presidency, he signed into law the Harrison Narcotics Tax Act of 1914 to ban the importation and exportation of all opium products, except when used medicinally (though prescriptions were still taxed and had to be registered with the IRS). Nevertheless, Wilson apparently did not believe that cannabis deserved such restrictions.

Rather, what he recognized was something that cannabis consumers should remind Americans to think about this Independence Day: “Liberty has never come from the government. Liberty has always come from the subjects of it. The history of liberty is a history of resistance.” 🌿





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- 2**
GIRL SCOUT COOKIES
\$290
- 3** NA
GRAND-DADDY PURPLE
\$240
- 4** NA
OG KUSH
\$347
- 5** NA
LEMON HAZE
\$238

(Ruby Slippers)
"This is a *sativa*-dominate hybrid from Ancient OG and Kaya's Dream #38"
-San Francisco, CA

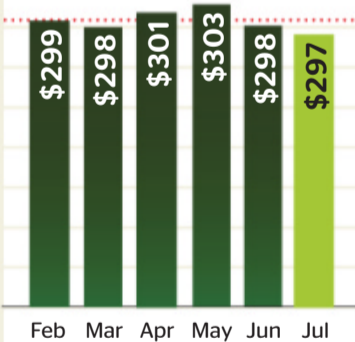
(Miss X)
"At 34 percent THC, Miss X is a heady companion for your Vegas trip."
-Las Vegas, NV

MARKET ANALYSIS

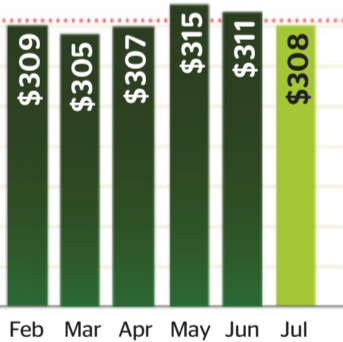
Prices by the ounce

All indices finished July below their previous month's average. This is the second consecutive month that prices have dropped across the US Price, Eastern and Southern indices. However, unlike last month, July's price drops were minor—the biggest decrease in average price was just \$4. July's top five submitted strains saw four newcomers, including a surprise first place finish for Jack Herer.

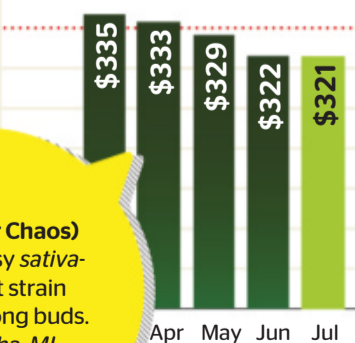
US Price Index
YTD Average: \$299



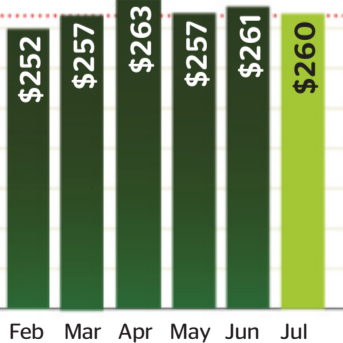
Eastern Index
YTD Average: \$310



Southern Index
YTD Average: \$330



Western Index
YTD Average: \$257



(Professor Chaos)
"This citrusy *sativa*-dominant strain produces long buds."
-Tekonsha, MI

TRANS HIGH MARKET QUOTATIONS

STATE	CITY	STRAIN	PRICE
ALABAMA	Albertville Fort Payne	Lemon Haze Bruce Banner #3	\$175 225
ALASKA	Juneau	Glacier Bear	276
ARIZONA	Phoenix	Jack Herer	240
ARKANSAS	Siloam Springs	Granddaddy Purple	450
CALIFORNIA	Los Angeles San Francisco	Purple Punch Ruby Slippers	260 305
COLORADO	Boulder Fort Garland	Golden Goat Axilla	200 115
CONNECTICUT	Hartford	Birthday Cake	285
FLORIDA	North Miami	Gelato	320
GEORGIA	Calhoun	Purple Kush	350
IDAHO	Boise City	Blue Dream	295
ILLINOIS	Carbondale	Bubba Kush	275
INDIANA	Indianapolis	Gelato	450
KENTUCKY	Lexington	Purple Gorilla	525
LOUISIANA	New Orleans	Girl Scout Cookies	270
MAINE	Kittery	Jack Herer	275
MARYLAND	Cumberland	Thai Landrace	400
MASSACHUSETTS	Boston	Haze	350
MICHIGAN	Tekonsha	Professor Chaos	340
MISSOURI	Independence	Granddaddy Purple	265
NEBRASKA	Omaha	Mimosa	170
NEVADA	Las Vegas	Miss X	410
NEW HAMPSHIRE	Claremont	GG #4	400
NEW JERSEY	Morristown	OG Kush	340
NEW MEXICO	Rio Rancho	Rare Darkness	295
NEW YORK	Mount Kisco	Lemon Kush	240
NORTH CAROLINA	Monroe	Blue Cookies	290
NORTH DAKOTA	Grand Forks	Bubba Kush	320
OHIO	Cleveland Heights	Girl Scout Cookies	315
OKLAHOMA	Tulsa	Jack Herer	350
OREGON	Eugene	Gorilla Breath	180
RHODE ISLAND	Portsmouth	Charlotte's Web	225
SOUTH CAROLINA	Myrtle Beach	Grape Ape	250
SOUTH DAKOTA	Huron	OG Kush	400
TENNESSEE	McMinnville	Afgoo	320
TEXAS	McAllen	Lemon Haze	300
UTAH	Salt Lake City	Girl Scout Cookies	280
VERMONT	Brattleboro	Jack Herer	340
VIRGINIA	Chesapeake	Cherry Pie	420
WASHINGTON	Seattle	Gelato	270
WISCONSIN	Madison	OG Kush	300
INTERNATIONAL			
AUSTRALIA	Sydney	Trainwreck	AU\$350
CANADA	Toronto	Ghost Train Haze	C\$215
TURKEY	Istanbul	Turkish Landrace	TR\$390

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(Glacier Bear)
"Very colorful buds coated with snow-like trichomes."
-Juneau, AK



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The Hash Queen

MILA JANSEN ENTERED THE MALE-DOMINATED WORLD OF CULTIVATION AND HASHMAKING AND BECAME A CANNABIS ICON AND WORLD-RENOWNED HASHISH EXPERT. LEARN HOW HER TRAVELS AND SUBSEQUENT INVENTIONS FOREVER CHANGED THE CANNABIS WORLD.

By Cassandra Purdy

THE BORDER OF Afghanistan and Pakistan, 1968. A young Dutch woman and her child sit at the desk of a customs official, chatting casually while sipping tea and eating cookies. A large bag rests between the woman's knees. Meanwhile, machine-gun-toting soldiers are searching the bus she was on for contraband, focusing on the few Europeans who have just crossed the Khyber Pass. The search finishes, the official carries the woman's bag to the bus for her, and the child waves goodbye. The bag contains 12 kilos of top-quality Afghan hash. The bag's owner is Mila Jansen, a.k.a. the Hash Queen.

The remote steppes of Kazakhstan, 2002. In the company of several police escorts/guides, a group of foreigners drive a jeep into a field of wild marijuana and a middle-aged woman hauls equipment onto the ground strewn with trampled pot plants. The acres of self-sown bud stretch as far as the eye can see. Buckets of ice brought from the distant town are dumped into a barrel lined with cloth bags and the woman and her companions take turns vigorously stirring. Local police and Russian researchers are all equally charmed by the woman and the result of her efforts—only Mila Jansen, who by now has become an intrepid world-traveling hash expert, would go to such extremes in the name of hashmaking.

Mila is not known for being a smuggler, or a research scientist, but her relationship with cannabis is coupled with a

strong sense of fearlessness and wanderlust. At 74, Mila is now recognized around the world as a cannabis icon. Her many inventions, including the Pollinator, revolutionized the hashish industry, and her Dab-a-Doo competitions attract thousands of participants from all over the world. At the most recent Spannabis event in March 2019, Mila received an award for her inspiring autobiography, *How I Became the Hash Queen*, while cheered by throngs of fans chanting her name. In this era of female empowerment, her book is being heralded as an invaluable contribution to cannabis *herstory*. *High Times* recognized her as one of the 100 Most Influential People in Cannabis last year, and soon after she was presented with a Lifetime Achievement Award. How did this woman distinguish herself as an entrepreneur in a male-dominated industry and become one of the world's foremost experts on hashmaking?

Mila grew up in England playing hide-and-seek with her siblings in enchanted gardens full of flowers and berries. She knew from a young age she had a special connection to plants, and this affinity quickly grew into a true green thumb. Her family moved back to the Netherlands when she was 11, and by the time Mila was a teenager, she was working in a nursery making chrysanthemum clones. Plants, gardens, greenhouses, soil and seeds were all things that came naturally to Mila. This, combined with a growing affinity for marijuana, set the stage for her decades-long journey in the cannabis industry. As Mila says: "It was love at first tokel!"



Mila posing in 1967



In her early 20s, Mila was a single mom running a popular fashion shop in Amsterdam that clothed the most glamorous members of the new hippie scene. The store eventually morphed into a bohemian tea shop that became the hub of counterculture in the city. In prohibition-era Holland, the cafe attracted too much attention with its colorful customers, billowing pot smoke and loud music. As things started to heat up and the cops began harassing her, Mila feared the authorities might try to take her daughter away. She decided to make a big change in the course of her life and leave home. She set out on her first overland trip from Europe to India with a few friends and her 3-year-old daughter, Miloes, in tow. Looking for freedom and adventure, they piled in Mila's van and joined the flow of young people heading east in 1968.

Many unpredictable adventures ensued on the road, including losing her van, parting ways with her traveling companions and ending up alone with her toddler and just \$600 in her pocket. None of this fazed her, and only added to the spiritual tone of the journey. In her riveting memoir, Mila recounts: "The world was our home and we were ready to explore it." They hitchhiked, bartered Western clothes for local dress in markets in Afghanistan, traveled on foot and eventually arrived in Goa on Mila's 24th birthday. "We felt we had arrived where we were meant to be," she recounts. Goa at that time was not the raver's resort scene that it is now; it comprised wild empty beaches and fishing villages, with just a handful of free-spirited Westerners. As Mila describes: "We loved life Goan style; we loved living this dream... little was needed to sustain us. We did yoga and lived the healthy life,

In Nepal, Mila discovered the local government-run shops that sold hashish, especially the hand-rubbed version, *charas*, from the Himalayas.

This was the year of the first full-moon parties on Anjuna Beach and the beginning of a cultural phenomenon that endures to this day. As the heat of summer approached, Mila and many of her friends decided to head north, hitchhiking to Kathmandu in 1969.

In Nepal, Mila discovered the local government-run shops that sold hashish, especially the hand-rubbed version, *charas*, from the Himalayas. Always on the move, after six weeks Mila and young Miloes traveled onward via Delhi to Manali and the Kulu Valley, a region notorious for fine hashish. The journey included some time sleeping in temples and living with Shiva-worshipping sadhus who took them in as fellow wanderers. They taught her to how to make the *charas* she'd seen in Nepal, by rubbing her warm palms on the buds of wild marijuana plants they encountered and to smoke chillums as sacrament.

with fruit, fish, some LSD, a flute, playing in the sand, reading with my daughter, and cooking together on an open fire." There were just enough kids among the young families there that Mila started a homeschooling program on the beach and even became an informal midwife along with her best friend, because there were many pregnant women in their tribe. Ever an entrepreneur, Mila started selling hash cakes made from her precious stash of Afghani that had traveled so far.



Cannabis

×

Art

×

Culture

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Looking for adventure: Mila and crew explore the Himalayas.



This period was a truly ascetic experience. As Mila notes: “At this point Miloes and I had no possessions. Each of us carried a shoulder bag with a cotton blanket rolled up inside it. That was it. We had no money... It felt to us like a great freedom. So many of our plans and thoughts are connected to possessions, but when you have no money, it is of little use to think about where to travel, what book you want to read, what clothes you would like to wear, what you want for dinner, or any other things money can buy. All you can do is let go and have faith. Food and anything else you really need would come, and somehow it always did.” It seemed Mila was cut out for the monastic life, which became even clearer later when she discovered Tibetan Buddhism and even took robes as a nun for a while. She fell so in love with India that this first trip lasted two and a half years, and the country would eventually become her primary home for 14 years.

Mila returned to Holland in 1970 and married her boyfriend, Hans. They started life in the countryside in a farmhouse they renovated together with a garden. In 1972, she welcomed a son, Merl, and the little family settled in. That summer, she grew some marijuana in the backyard, the magical plant ever present in her life. As interested in fabrics, textiles and design as she was back in the days of her influential boutique, Mila started a business of hand-sewn baby carriers that she and her husband sold on the beach in Holland. These tiny entrepreneurial ventures came easily to her and always seemed to make a profit. But plans to create a school for traveler’s kids in India were flowering in

her mind and the pull to return was strong. Mila left again for India, this time by plane, pregnant and with two kids. Her husband would join them there. Mila and her family settled in the hill town of Almora and would call India home for over a decade. During that time, Mila and her family embarked on several ambitious treks, including one 900-mile journey through Ladakh and into the high Himalayas on foot with pack horses—something that had rarely, if ever, been attempted by Europeans.

In 1988, Mila returned to Amsterdam with her youngest child, 9-year-old Chimed, at her side, leaving two kids happily in boarding school in India and Miloes off studying in California. She was now a single mother of four children with no financial help from their fathers. Bolstered by the fact that her numerous business ventures in India had all been successful (importing evening dresses from Delhi and chunky hand-knit sweaters to Europe), Mila began searching for a way to support her children. Her fearless confidence that she would find a solution led her to connect with some friends who were growing weed in a greenhouse on their roof. In spite of her knowledge of clone-making and greenhouse skills, she “was not given a job just because [she] was a woman. Growing was a man’s world.” She had to convince them of her exceptional green thumb. Soon she had a box of clones in her closet and was working full-time on indoor grows around the city. Mila had found her calling and a way to survive, even flourish. She eventually was able to set up her own indoor garden and got a house on the canal where all her kids had their own rooms.



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Mila oversaw this 43,000 square foot greenhouse full of Orange Bud in 1992.

It was stressful working in Holland's complex, semi-legal cannabis industry. Gardens and greenhouses were regularly busted, and spaces had to be abandoned at a moment's notice. Finding discreet or well-hidden spots was difficult; Mila and some friends even ran a 60-light operation next door to a police station for two years. She often went out as a scout on her bicycle, a shopping bag of leeks in the basket on the handlebars, to see if the grow was compromised or under surveillance. She was producing 8,000 clones of Orange Bud (a California strain popular in Holland at the time) per month, just for her and her associates' own gardens, which numbered 14 at the time and were hidden in warehouses, attics and cellars all over the city.

One cold November night in 1992, Mila found herself smoking a joint while absentmindedly watching the dryer spinning clothes. The tumbling barrel suddenly suggested a life-changing idea. Wouldn't this be the perfect mechanism to gently break the trichomes from the leaves of cannabis plants? Within days, she had begun working on a prototype of what would become the Pollinator—a fine screen stretched over a rotating tumbler, with a surface below to catch the crystals. She quickly discovered it worked even better outside in the cold, and she had one set up in the courtyard



The Queen at Dab-a-Doo in Amsterdam

working day and night that winter. Suddenly all that “useless” trim from their gardens was being sifted into clean resin heads and then pressed into hashish. The concept of “hash from trash” was born.

In 1993, Mila and her partners' biggest garden was busted and the police discovered the never-before-seen centrifuge-like hash machines. They lost everything but, fortunately, Mila was not there when the raid took place. The newspapers ran headlines about the bust—NEDERWEED BECOMES BIG BUSINESS and EXPLOSION OF

[Mila] was producing 8,000 clones of Orange Bud per month, just for her and her associates' own gardens, which numbered 14 at the time and were hidden in warehouses, attics and cellars all over the city.

GREEN GOLD FEVER. After that setback, Mila began working in another huge greenhouse that was unfortunately discovered by the police right at harvest time, and the front page of the *Telegraaf* blared MARIJUANA GREENHOUSE THE SIZE OF A FOOTBALL FIELD. It seemed that maybe it was time to focus on the hash-making machines and take a break from growing. By mid-November of 1994, Mila was ready to present a finished prototype of the Pollinator at a party hosted by Adam Dunn of T.H.Seeds during the High Times Cannabis Cup. Rob Clarke pulled off the velvet cloth and revealed the machine, which Mila then demonstrated. Many legendary figures of the cannabis world were there to witness the moment, Jack Herer and Soma to name a few. It was the beginning of a new era for Mila—she was becoming the Hash Queen.

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High Times honored Mila as one of the most influential people in cannabis in 2018.

In 1995, Mila registered the Pollinator Company and a whole industry was born of this first invention, quickly followed by the reimagined washing machine known as the Bubbleator and the ice-water system of fine micron bags known as the Ice-o-Lator. In 1996, the Pollinator was featured in *High Times* and the article raved: “Mila has changed the face of the Dutch marijuana industry.” The

machines began selling like mad, and the company developed larger, more industrial versions. As Mila explains: “Hash was a new product you could make from your waste leaf material. Pollinators were becoming more popular, and Nederhash was available in more coffee shops.” The company began receiving orders from all over the world, and soon the machines were introduced in America.

The Pollinator Company’s machines continue to sell. Mila is now widely acknowledged as one of the world’s foremost experts on hashish, and she’s mentored many young innovators, such as Nikka T of Essential Extracts. There is rarely a competition now that doesn’t request her services as a judge for extracts, and Mila has started her own event, called Dab-a-Doo, which began in 2013 and takes place all over the world. This coming fall, she will embark on a South and Central American tour hosting several Dab-A-Doos in countries such as Mexico, Colombia and Chile.

The story of Mila Jansen is one of survival and overcoming hardships with resourcefulness and indomitable will. Her entrepreneurial spirit is an inspiration for other women, especially single mothers seeking to find their place in the cannabis world. As Mila says: “Do what you dream to do, and give it your all. Always follow your heart.” What a queen. ✨

Mila’s memoir, How I Became the Hash Queen, is available through mamaeditions.com and pollinator.nl and as an e-book on amazon.com.

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A Beginner's Guide to CBD

CBD SEEMS TO BE OMNIPRESENT THESE DAYS, BUT HOW DOES IT WORK? WHAT'S IT USED FOR? CAN IT PROVIDE RELIEF? OUR HANDY EXPLAINER BREAKS DOWN EVERYTHING YOU NEED TO KNOW ABOUT THE ULTRA-POPULAR CANNABINOID. *BY JESSICA DELFINO*



CBD is enjoying mainstream popularity.

CBD IS THE IT CANNABINOID RIGHT NOW—it's simply everywhere. You'll find it as an ingredient in things like lip gloss, bath soaks and bombs, soaps, moisturizers, pet treats, chocolate, olive oil, personal lubricant, muscle rubs and cookies. Of course it's also available in tinctures and pills meant to do everything from reducing PMS symptoms to alleviating anxiety.

CBD has a fiercely devoted fan base, and new promising products seem to be popping up every day. This popularity is likely tied to the fact that many of the items containing CBD claim a wide array of seductive benefits, from treating insomnia and working as an anti-inflammatory all the way to potentially reducing PTSD and seizures.

We've all got problems; some of them literally keep us awake at night. With all the fanfare around CBD, you might be wondering if it can cure what ails you. This beginner's guide to CBD will help you better understand the cannabinoid, what it does and how it can help.

WHAT IS CBD?

CBD, or cannabidiol, is a cannabinoid found in the cannabis plant. It is one of the many (more than 100) cannabinoids identified in cannabis and is similar to THC (tetrahydrocannabinol), which is responsible for the high associated with consuming marijuana. Unlike THC, though, CBD is nonpsychoactive, meaning it doesn't produce a high, because the two components act differently on brain and body receptors.

While there's still a great deal of research to be done, CBD is being studied intensely right now due to its potential as a safe, nonaddictive substance that appears to offer users some relief from symptoms related to a slew of illnesses and conditions.

If you'd like to explore the reported health benefits of cannabis without the sensation of feeling stoned, CBD might be right for you.

“Evidence suggests that CBD has therapeutic and healing properties, such as the capacity to lessen the regularity of seizures, help treat insomnia, minimize panic attacks, treat certain types of depression and anxiety, and reduce pain, arthritis and inflammation.”



HOW DO YOU USE CBD?

CBD can be used in a wide variety of ways. It's available in tinctures and pills, and it can be mixed into food or drink. If vaping or smoking is more your style, you can find high-CBD strains or CBD-only extracts. You can also get your CBD through a variety of products like lotions or scrubs (there are even personal lubricants containing CBD).

Each method has a varying degree of usefulness, depending on what conditions it is intended to treat and who is using it. For example, consuming tinctures might be more useful for fighting inflammation than smoking or vaping, but smoking or vaping CBD could be extremely useful to someone trying to quit cigarettes or reduce or eliminate their nicotine intake. But then there are some who experience little to no benefit from using it.

WHY USE CBD AT ALL?

Some evidence suggests that CBD has therapeutic and healing properties, such as the capacity to lessen the regularity of seizures, help treat insomnia, minimize panic attacks, treat certain types of depression and anxiety, and reduce pain, arthritis and inflammation and more. While much of this evidence is anecdotal, it points to the idea that CBD may offer help to those who need relief but have not been able to find it using

traditional medicine. In addition, hearsay or not, the mountains of positive feedback leave little doubt that there is, in fact, something to THC's sister component. At the very least, some people have found remarkable relief through the use of CBD.

HOW DO I GET STARTED WITH CBD?

Trista Okel, the creator of Empower, a line of CBD and cannabis health and beauty products that includes personal lubricants, lotions, rubs and tinctures, suggests starting with a topical, or a product that is used by being applied to the skin. "Topical products aren't psychoactive," she said. "Soaking in a bath with the salts and then applying an oil [such as Empower's Topical Relief Oil] is a powerful combo for relief and relaxation."

Dr. Jenelle Kim, who has spent the last 15 years developing natural products for high-end spas and outlets such as the Ritz-Carlton and Whole Foods, said that makeup is a safe and easy way to dip one's toe in.

"Beauty products containing CBD are a wonderful way to be introduced into the world of benefits that CBD provides," Kim said. "When incorporating balanced CBD formulations into your daily regimen, which is the main goal coming from an Eastern medical, herbology perspective, you will experience great results."

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WILL IT WORK FOR ME?

Like any product or medicine on the market, individual results may vary. While many users champion this so-called miracle drug, there are some who were disappointed with their experiences.

John Garrett, a Tacoma-based writer and film producer, tried using CBD to help manage his debilitating anxiety. "I'd only heard amazing things about CBD oil," he said, "but after trying four different products, nothing."

Still, many other users have experienced the exact opposite. Monika T. from Northern California claimed to have a condition cured by cannabis. "FECO [full extract cannabis oils] cured my cutaneous follicle lymphoma," she said. Monika found relief with cannabinoids, but they are not a panacea, and it is extremely important to discuss serious medical conditions with your physician, and to find out if CBD use is advisable when receiving other treatments.

Clint Alan McCown and Yvonne Ybarra are an Austin-based couple who both use CBD for their ailments—Clint for sleep issues and Yvonne for pain from a dance-related injury. "I've been using it for three years," Clint explained. "My girlfriend [Yvonne] cried tears of joy after three days of use."

Bryan Neustein, a wine broker in the Los Angeles area, is another customer singing CBD's high praises. "I love it and use it daily," he raved. "It really helps my sciatica and insomnia. Plus, my friend's 3-year-old who suffers from micro-seizures says it has completely stopped the seizures once he started taking it."

With encouraging examples such as these, it's no wonder CBD has enjoyed such

widespread enthusiasm and popularity. But it's up to each person to examine the facts and information carefully and decide if CBD is worth trying. Concerns might include an (albeit rare) allergy to cannabis, the fact that many CBD products can be cost-prohibitive and the challenge of where to find it—though, with its ever-increasing popularity, finding CBD is becoming less and less of a problem.

A conversation with a medical professional won't hurt and is, in fact, encouraged. Though there are few issues on record with negative drug interactions or ill effects of CBD on children, people who are pregnant, lactating or taking certain prescription drugs should proceed with caution and careful consideration.

BUT WILL IT GET ME HIGH?

No. Empower's Trista Okel shares the details behind why, for example, a topical lotion containing CBD can't get a user high, yet can offer pain relief.

"The cannabinoid molecules, such as CBD, are large and don't reach the bloodstream when applied to the skin," she said. "CBD does go deep enough to activate the TRPV-1 and PPAR-gamma receptors in the skin and suppress the TNF-alpha enzyme; all of these actions result in reducing pain and inflammation."

Taking CBD internally is nonintoxicating too. However, some users report feeling some physical sensations or a calmness when they consume CBD. Others compare CBD to drinking a half a glass of wine or a Valium, and report anxiety and stress reduction when used via tincture drops in a beverage, for example.



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OILS



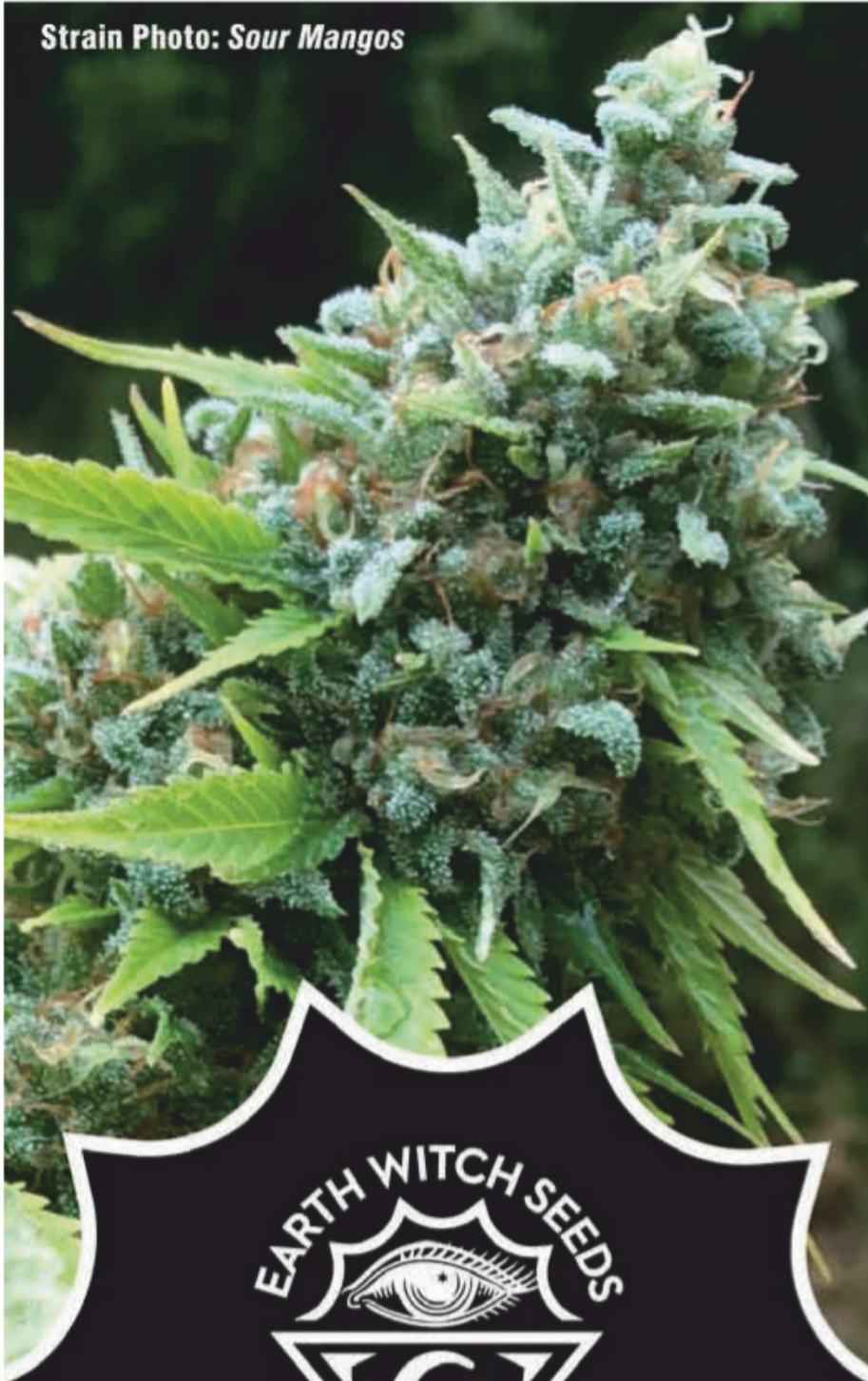
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Like our oils, we carefully mix our oil base to create amazing topical products for relief of stress, pain or anxiety. These are one of the best ways to enjoy CBD products.

Strain Photo: *Sour Mangos*



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What can CBD
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BENEFITS OF CBD

As mentioned, CBD use has been associated via anecdotal evidence and some research with the reduction of insomnia, rheumatoid arthritis, PTSD, certain types of seizures, anxiety, muscle pain and inflammation, stress and anxiety, eczema and a host of other illnesses and conditions. Many of these health concerns allow for patients to legally obtain a medical-marijuana card from their doctor.

CBD isn't a miracle drug and shouldn't be treated as such. But it serves a whole slew of purposes with varying degrees of success, and many people find the upside of giving it a try to greatly outweigh the potential hazards.

WHAT ABOUT PETS?

Pets are included in the bevy of anecdotal evidence supporting the benefits of CBD.

Holly DeRito, an NYC-based animal activist and entrepreneur behind [cannabuddykitchen.com](https://www.cannabuddykitchen.com), created her own line of CBD products for pets that are safe enough for human use as well. "It tremendously helped my fibromyalgia and the anxiety in my dog," she said. "My own veterinarian started buying my topical salve for his bulldog's arthritis after his pharmaceutical resources stopped helping.

He found it the only thing that gave her relief."

DeRito explained that CBD has also helped dogs that her animal-rescue organization, [waggytailrescue.org](https://www.waggytailrescue.org), has helped foster, helping them to adjust to scary new environments and to travel calmly.

When choosing CBD products for a pet (or human), be sure to read the ingredients in order to ensure that it's coming from a safe source.

NOT ALL CBD IS CREATED EQUAL?

Unfortunately, no. Just like any food item, lotion, beauty product or consumable, CBD is subject to being produced improperly or cheaply. Some manufacturers may add fillers or subpar ingredients to cut their own expenses and make more of a profit.

When selecting a CBD product, it's best to look for those companies that have their testing information available on the packaging or via a QR code. With this, a consumer can then analyze the product's certificate of analysis on the company's website.

So, as with any health-related product, make sure to read, research, get recommendations and ask for advice in order to find the best-quality items when trying to use CBD to soothe whatever ails you. ✨

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THE LEGENDARY CANNABIS BREEDER KNOWN AS SUBCOOL SURVIVED A NEARLY FATAL DIAGNOSIS, THE FIERY DESTRUCTION OF HIS HOME AND POSSESSIONS, AND A MESSY DIVORCE FROM HIS WIFE AND BUSINESS PARTNER TO RISE FROM THE ASHES WITH A NEW VENTURE CALLED THE DANK. *BY DANNY DANKO*

the rebirth of **STUDD**

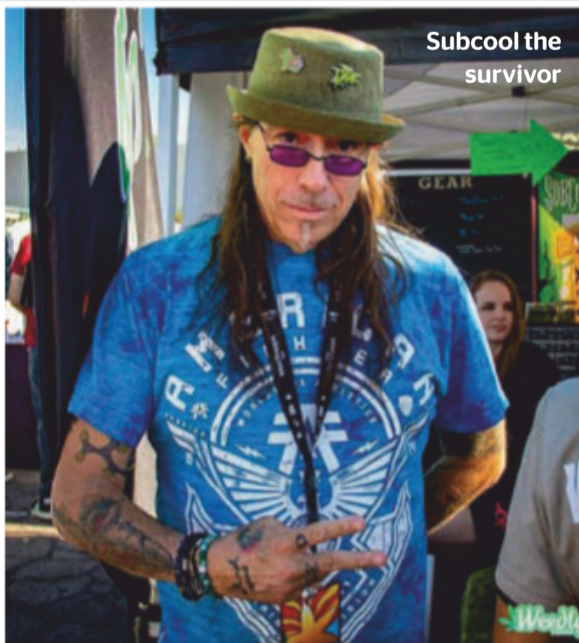
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**Subcool the
survivor**

his story

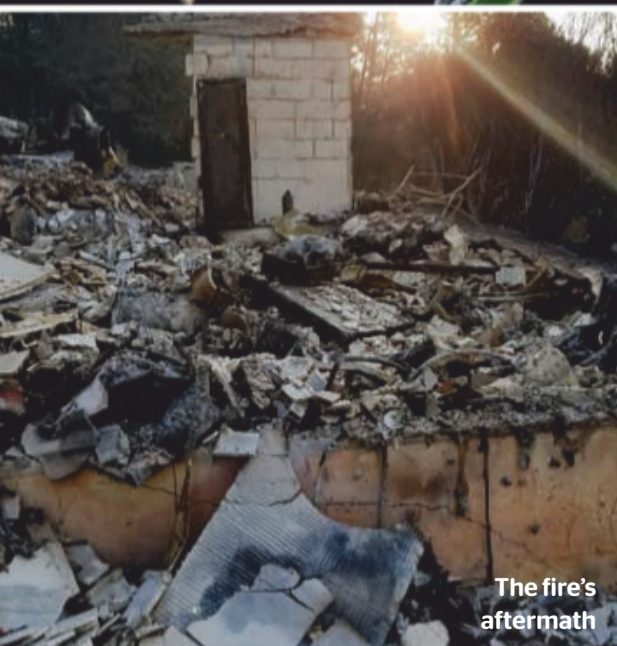
Subcool's passion for cannabis started early in life. He began growing in the 1970s and eventually found himself in trouble with law enforcement and in jail. His defiant return to cultivation resulted in a subsequent bust and he wound up serving time in prison, a stint that ignited a passion to change cannabis laws and help free the healing flower for good.

Subcool moved west and his prowess in breeding and growing eventually led him to found Team Green Avenger Seeds. He first came to my attention in the forums of *overgrow.com*, where he shared information and photos of his lovely cannabis specimens. In 2006, I chose his Jack the Ripper as one of our *High Times* Top 10 Strains of that year, and he was eventually inducted into the *High Times* Seed Bank Hall of Fame in 2009. His Vortex strain, entered under a different name, won the first Cannabis Cup in the United States in 2010 in San Francisco.

Along the way, Subcool also became a regular contributor to *High Times* magazine, the author of both *Dank: The Quest for the Very Best Marijuana* and *Dank 2.0*, and, more recently, a winner of the *High Times* Dr. Lester Grinspoon Lifetime Achievement Award. His popular *Weed Nerd* show on YouTube chronicles his cannabis growing and breeding, showing a slice of his life to a legion of Weed Nerds who follow his exploits and test seeds for new strain releases.

COURTESY OF SUBCOOL (2), TEAM TERPENE (2)

The Deadlights strain tests high in CBD.



The fire's aftermath

the fire

In 2013, Subcool was diagnosed with alpha-1 antitrypsin deficiency, a genetic form of emphysema and a progressive lung disease. He moved from Oregon to California for better weather—and “because I had always dreamed of living in Sonoma County where any adult could cultivate 30 plants per household, and that’s exactly what we did,” he tells me. “I’m technically disabled and my lungs only have 70 percent capacity. Growing is hard work, so I have to depend on others to lift and carry things. When I’m really sick, I am hooked to an oxygen concentrator and can barely walk.”

Despite his health setbacks, Subcool and his then wife and partner, MzJill, continued to build a company staffed with fellow growers/breeders now known worldwide as TGA Genetics (The Green Avengers). But Subcool’s illness and treatments were wearing on him. He says he “lost his kind nature.” Then came the day that would change his life forever.

October 8, 2017. MzJill and Subcool were already planning to separate when fast-moving flames burned their home in Santa Rosa to the ground. The wildfire eventually destroyed 8,500 homes and killed over 60 people. Sub and Jill were lucky to escape with their lives, but they lost everything, including almost four million seeds and all of the male and female breeding plants they had saved over many years. Devastated, the pair went their separate ways, and Subcool tried to pick up the pieces and move on.



The Dank is grown commercially worldwide.

the dank

Without a home, Subcool began to build his new life and restore his cannabis-genetics library. One year later, he has an arsenal of 44 Dank strains stocked up and distributed worldwide. But it wasn't easy. Without any tools to run his business, he and his partner, William Rouland, sourced back lost parent stock from close friends who held cuttings of the plants. He even had to purchase some of his own seeds.

Slowly, they rebuilt his core strains using original mother and father plants. Strains like Jack the Ripper, Vortex and Querkle were reproduced, and Sub also started creating new strains and placing them into his large testing program.

Sub also had some issues with hemp russet mites that almost shut him down again. "I took in lots of new cuttings, and one of these came with a present—HRM, or hemp russet mites—and they almost caused me to move and stop growing altogether," Sub tells me. "Instead of giving up, I tried literally everything, including heating plants to 122 degrees, raising CO₂ levels in the room to 10,000 ppm, WPF97, Venerate, Flying Skull, Dr. Zymes [insecticides] and wettable sulfur. In the end, it took a combination of all of these and killing 40 full-size plants in flowering. Most importantly, I learned the use of predator bugs and organic IPM [integrated pest management] methods, and now my garden is healthy, happy and producing amazing-quality cannabis."

One interesting story Subcool relates to me deals with reacquir-

ing Strawberry Cough for his Strawberry Daiquiri strain (Strawberry Cough x Space Queen). He took a trip to Hollywood and struck a deal with Kyle Kushman to grow his genetics out and work with his famous Strawberry Cough alongside a new cut called Stardawg. Their collaboration has been dubbed "the Dank Brothers."

"To bring the story up to date, we now have many collaborative strains in the 'tester's network,'" Subcool says, "and have just released a new strain called Strelka, which is a delicious cross of my cherry-infused, resin-coated Space Queen dad with Kyle's fruity/diesel Stardawg female, fully endorsed by two old-school growers and friends. The results have been amazing, and we look forward to this cross becoming highly sought after in the new cannabis world."

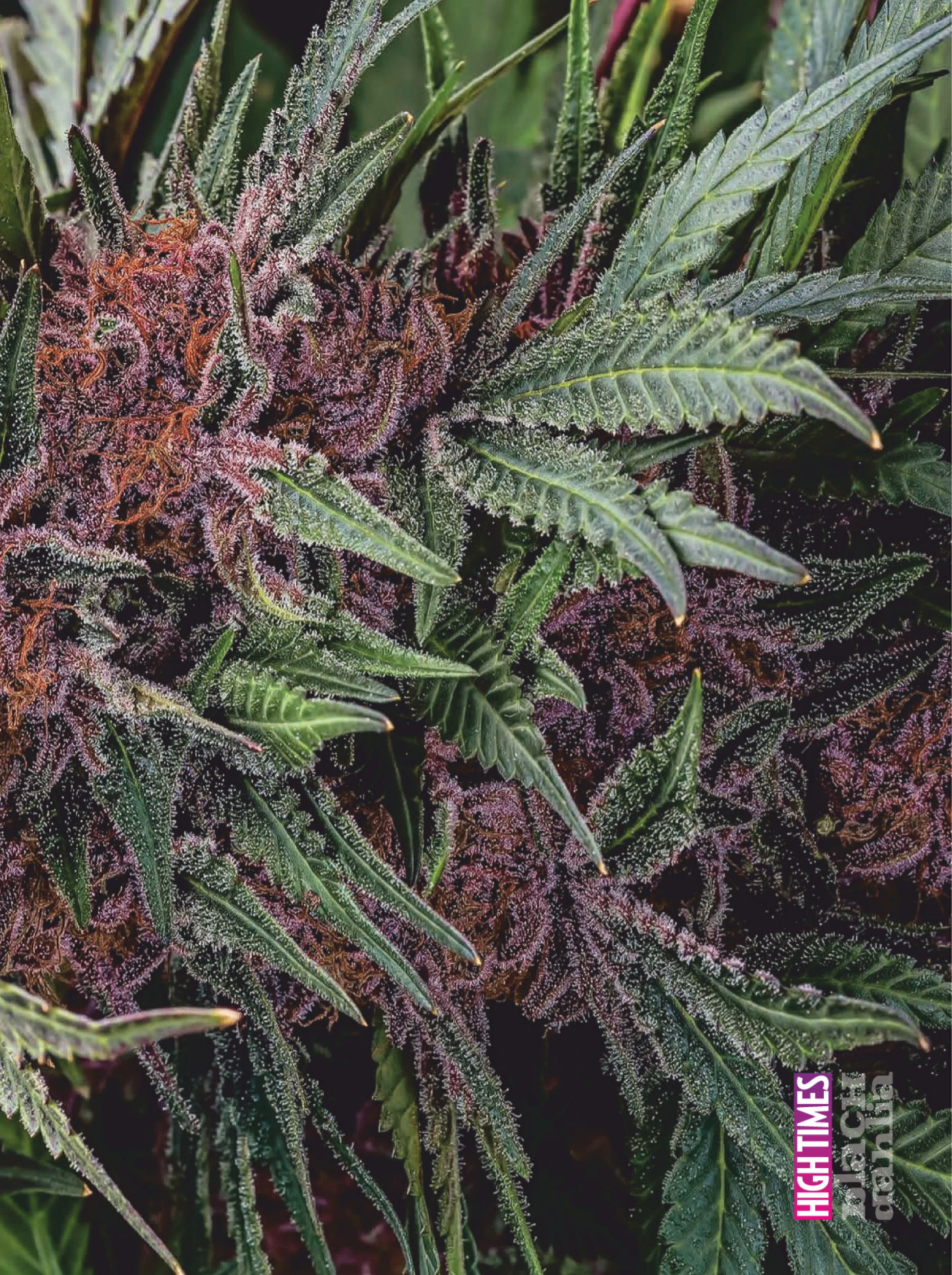
On February 20, 2019, Subcool and MzJill met in mediation to officially separate. Subcool surrendered TGA Genetics IP to her and officially became the Dank, the same name of his two books. He also gave up the rights to the following strains: Jillybean, Agent Orange, Brian Berry Cough, Orange Velvet, Ace of Spades, Plushberry, Black Dahlia and Time-wreck, and he and MzJill agreed to the joint use of Space Queen.

Sub tells me he regrets the role he played in his and MzJill's messy and public breakup. "I promoted TGA for 18 years," he says. "I did a good job, but I feel that the magic fell apart the night of the fire. I do not know the fate of TGA, but my work, my strains and my passion continue on in the 44 strains that make up the menu of the Dank."

chernobyl







HIGH TIMES

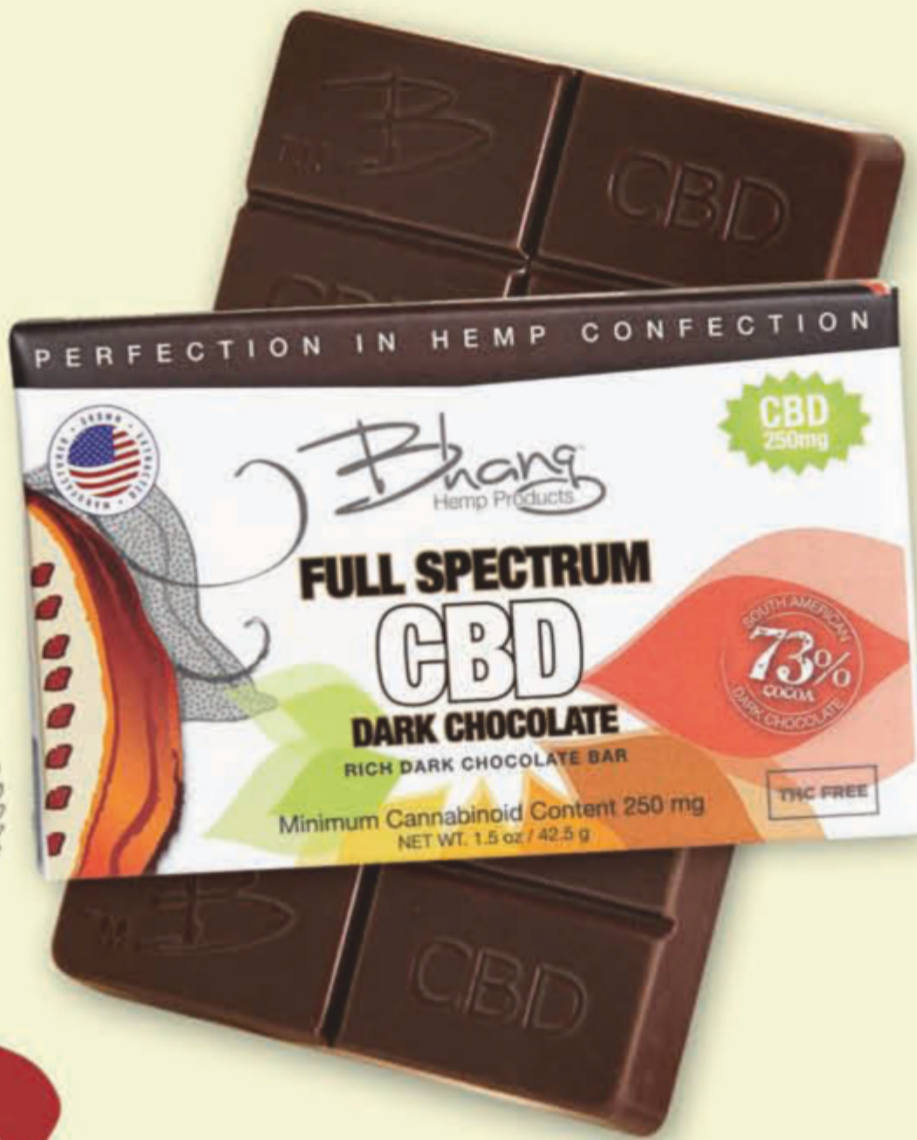
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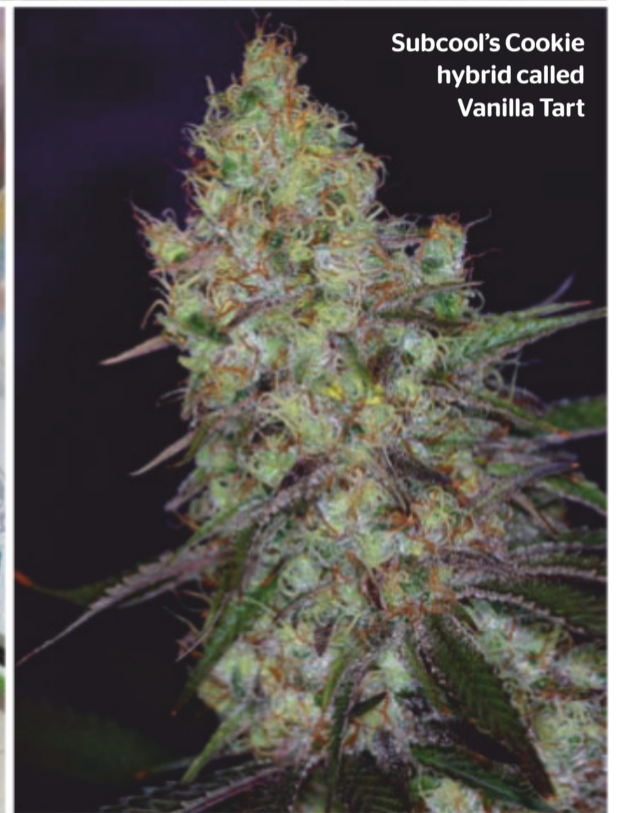
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Subcool tried growing Mendo Dope style plants in a pool!



Plants in the pool are trained into their trellising.



Subcool's Cookie hybrid called Vanilla Tart

the pool grow

Subcool settled in Arizona and rented a home with an indoor pool, drained it and started growing cannabis inside it under Arizona's medical program. Now, with his new home converted to a state-approved 60-plant grow op, his mission to continue working with his beloved cannabis plant continues in a very unique environment.

Sub explains to me: "The wet air made it impossible to breathe, so one day I drained the pool. Someone online joked about the old Cheech and Chong skit [in which the duo have a grow op in an empty pool], and I took the challenge." Solis Tek gave him a good deal on the lights, and he put 8,000 watts of double-ended high-pressure-sodium fixtures above the 20-by-30-foot pool. Smart Pot donated custom 100-gallon air pots, and Dragonfly Earth Medicine contributed organic teas to feed the plants. To complete the giving chain, the cannabis he grows in the pool is donated to patients entirely for free!



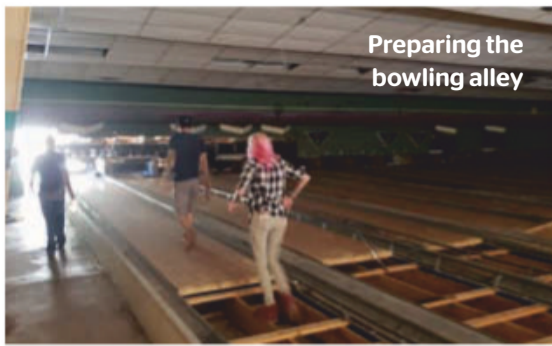
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Preparing the bowling alley

the bowling alley grow

Sub also sent me photos of a brand-new facility he and his team are building out in what used to be a bowling alley. He tells me: “With the support and help of [grow visionary] Eli Harding and William Rouland, the bowling alley in Globe is almost complete, and in just a few weeks we start moving in plants. We will grow in my Super Soil using my methods and grow as close to organically as

possible. Everything will be tested, even though it isn’t required in Arizona. The Dank will set new standards for packaging, testing and distribution. The state-of-the-art kitchen has glass walls, so all aspects can be filmed and supervised for quality control.”

Subcool tells me he’s enthusiastic about the future: “I get to start hundreds of seeds and do pheno hunts of my favorite strains. Once we find the best, we’ll use Phylos Bioscience to map and protect our versions of each strain. Each strain will have quality standards for terpene and cannabinoid production. I’m excited, but I also understand the long road we have in front of us. Growing cannabis has so many variables, and so many things can go wrong. We stand at the brink of success or failure, and all of us won’t look back until we handle all adversity and make something truly Dank!” 🌿

You can find verified Subcool seeds online at the Dank (subcool.com) and at major seed distributors like Attitude Seedbank, Seedsman and JBC Seeds. Look for the Dank’s consumable cannabis products in Arizona dispensaries this summer.

Dawggone Sour is a collaboration with Kyle Kushman and Badger.



FIVE GROW TIPS FROM SubCOOL

STICK TO THE BASICS, transplant on time, take notes, keep your room spotless and don’t procrastinate on the small things, because they make a huge difference.

LOW-STRESS TRAINING, plant bondage and super-cropping are every bit as important as what you feed your plants.

PROPER CARE WHEN HARVESTING is crucial. Make sure you have a dedicated drying area that’s cool, clean and not too dry. Lots of people mess up a great crop at the very end by rushing things.

NEVER STOP LEARNING, experimenting and pushing the boundaries of our craft.

TEACH SOMEONE TO GROW—the gift will be returned to you in other ways.

NEW DANK STRAIN ALERT!

dawggone sour

LINEAGE: Stardawg x Jack the Ripper
Sativa/Indica: 65/35

HARVEST WINDOW: 58-63 days
Heavy producer
Good for fatigue, stress and anxiety

PHENOTYPES: *Sativa*-dominant pine-tree shape

HEIGHT: Tall and wide

YIELD: Heavy

INDOOR/OUTDOOR: Performs well in both

BEST WAY TO GROW: Large topped bushes to prevent stretch and promote lateral growth

HIGH TYPE: Medical users might like the soft waves of pain relief and appetite stimulation. Recreational users wake and bake with it, enjoy their out-of-body spiritual journeys or try to get things done—especially creative tasks!

TASTE: SweetTarts, lemons, pine, guava, lemon, diesel, Chem

An epic three-way collaboration between Kyle Kushman, Subcool and Badger, this cut, bred by Top Dawg Seeds, was selected by Kyle and gifted to the Dank team for breeding projects. It’s got a devastating potency, and it’s a very greasy, oily plant with a strong sour-fruit smell.

Dawggone Sour smells like Sour Patch Kids with undertones of guava, lemon and Chem mixed with undertones of pine and fuel. The plants will stretch quite a bit. Dawggone Sour packs on huge weight in the last two weeks and has large resin glands. Medical patients should select it to help manage symptoms of fatigue, stress and anxiety. It blunts pain, alleviates digestive issues and produces the munchies so people can gain weight. Others choose it in order to help sleep at night or to manage the symptoms of multiple sclerosis or Parkinson’s disease.

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Why Sensizym Organic OIM Is Critical For Growing Top-Shelf Flowers

As a grower, you're striving to cultivate the healthiest, cleanest, highest-yielding crops possible. But did you know that one of the biggest factors in producing top-shelf flowers is enzymes?

That's right — as with our own bodies, the high-value crops we grow require enzymes to help them carry out critical biological functions. What's more, the right enzymes can keep your roots clean and strong while helping support healthy plant growth.

That's where Sensizym Organic OIM comes in. It contains a specialized active enzyme blend that scours your root zone for dead debris to keep roots clean, white and bright. Plus, it's approved for organic crop production and stamped with California's Organic Input Material Program seal.

Now, let's take a closer look at enzymes and the role they play in high-value crops.

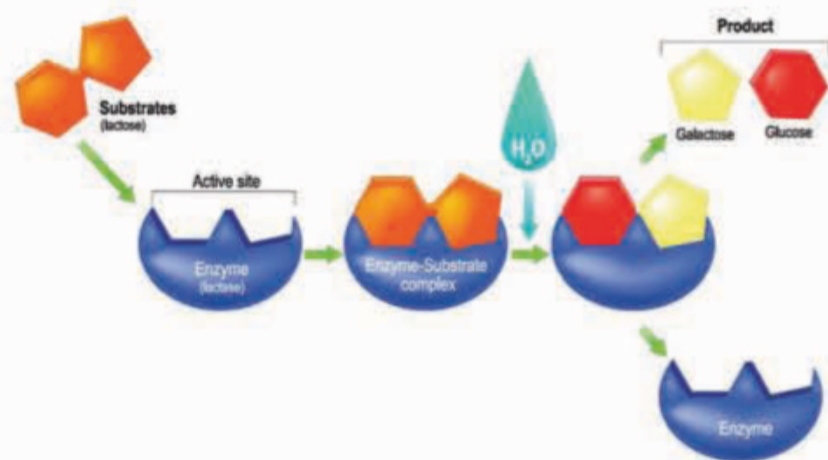
Enzymes 101

Enzymes are proteins that are produced within living organisms. The job of enzymes is to bind with molecules, called substrates, and convert them into other molecules.

One example of this is lactose, a sugar that requires the enzyme lactase to break it down.

People who are lactose intolerant often don't have enough lactase enzymes in their digestive systems to process lactose quickly and efficiently.

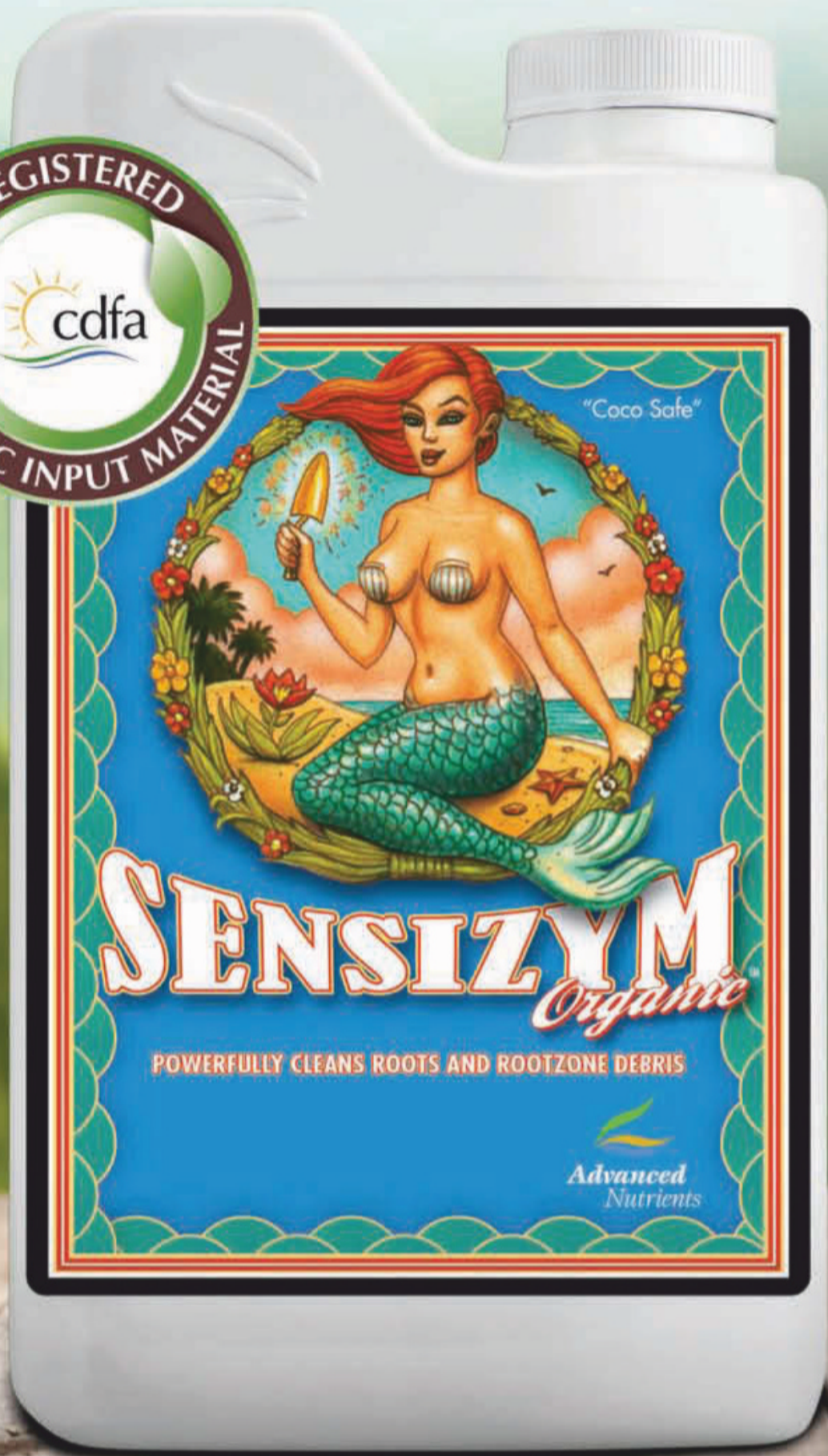
Enzyme Action



Enzymes In High-Value Crops

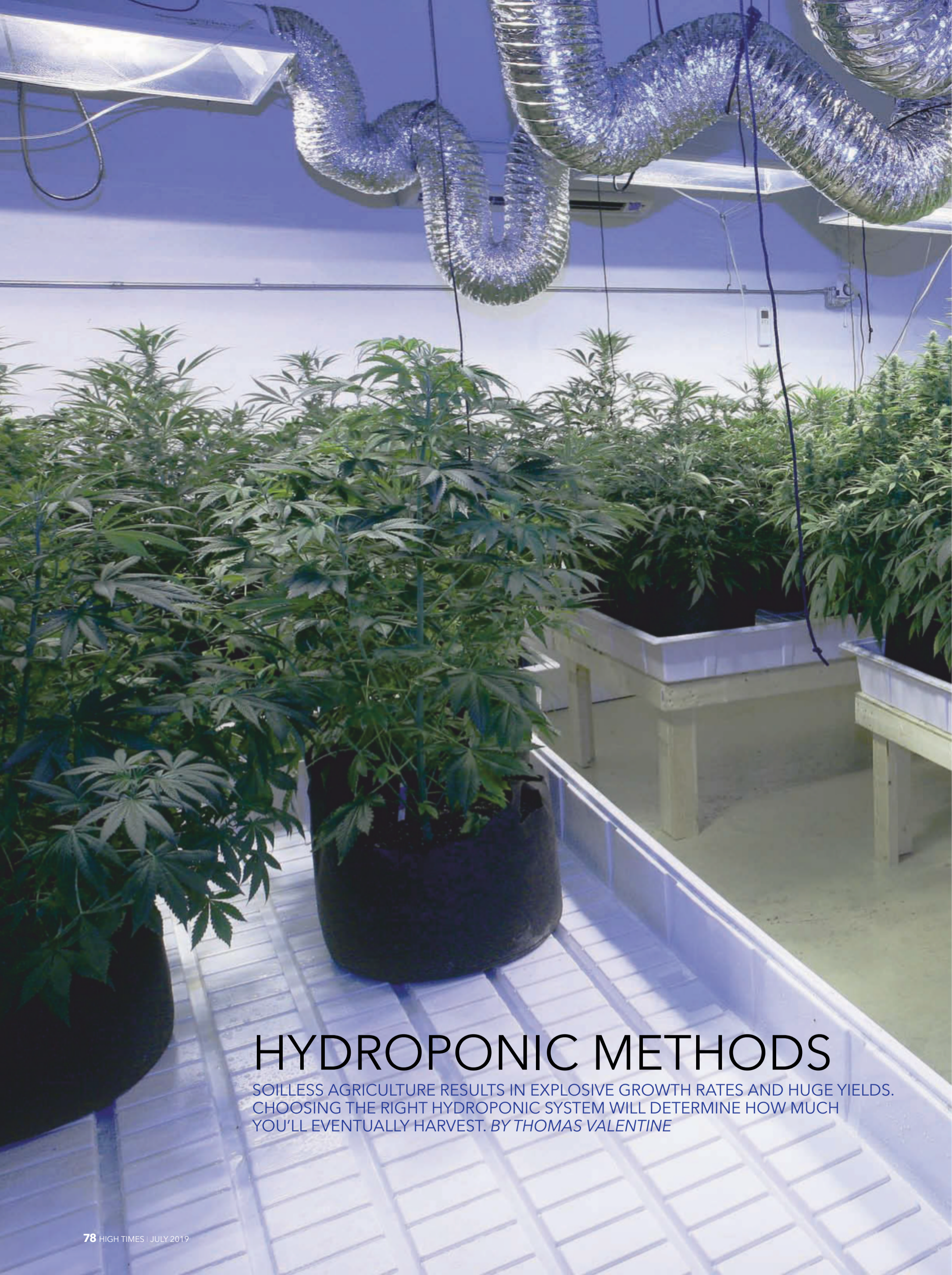
Like humans, plants contain literally thousands of different enzymes that facilitate all sorts of functions. But you can also enhance your crops with additional enzymes — that is, specialized enzymes that can keep your roots clean and bolster the health of your high-value crops.

That's exactly what Sensizym Organic OIM does. This proprietary three-enzyme blend breaks down dead organic matter in the root zone — which can attract and harbor harmful pathogens — and turns it into a nutritious food source for your plants. By keeping your roots clean and free from debris, your crops will be much less susceptible to disease.




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HYDROPONIC METHODS

SOILLESS AGRICULTURE RESULTS IN EXPLOSIVE GROWTH RATES AND HUGE YIELDS. CHOOSING THE RIGHT HYDROPONIC SYSTEM WILL DETERMINE HOW MUCH YOU'LL EVENTUALLY HARVEST. BY THOMAS VALENTINE

A photograph of a hydroponic grow room. In the foreground, a white ebb-and-flood tray is filled with numerous cannabis plants in various stages of growth. The plants have green leaves and some are showing early flower buds. Above the plants, several large, flexible, silver ducts are suspended from the ceiling, likely for ventilation or CO2 enrichment. The room is lit with bright, cool-toned grow lights. In the background, a white door and some equipment are visible. A yellow bucket is on the floor in the lower right corner.

These ebb-and-flood trays periodically fill with nutrient solution to hydroponically feed plant roots.

BE LIKE WATER

We've all heard of hydroponics and the great things that can be done with it. However, choosing which type of hydroponic method to use in your individual situation can be a dilemma. That said, I've taken it upon myself to inform and educate you, the information-hungry grower. I'll cover the commonly used methods, outlining the pros and cons of each. Hopefully, these lessons will rub off on you, and you'll make the proper decision to suit your individual requirements and situation.

Your hydroponic setup can be as complicated or as simple as you like—it's up to you. You can incorporate pumps, aerators, valves and switches, or you can fill a bucket with nutrient solution and simply pour it over your soilless growing medium. The flexibility of hydroponics is one of the main reasons it's so effective and popular.



Individual drippers deliver liquid plant food directly to rockwool cubes.

PEAT & PERLITE (SOILLESS MIX)

This most basic of methods uses a common planting container filled with peat moss and fortified with perlite. This method is the ultimate no-brainer, requiring little or no maintenance for the entire life cycle of your plants—you simply feed them some nutrient solution once or twice a day and watch them explode into lovely green foliage.

Perlite is required to increase the moisture-holding capacity of your growing medium. It's cheap, commonly available and wonderfully inert, so it won't interact with your nutrient solution to rob your pride and joy of essential nutrients.

A rockwool cube with your rooted clone or seedling is slightly buried in the pre-moistened peat and perlite. Be sure not to cover the top of the cube, just its sides and bottom. Peat is very porous, so the roots have a very airy environment to grow through, and this moist,

oxygen-rich environment is exactly what they need to gain a solid footing in the growing medium. Rapid and prolific rooting is the key to future foliage growth.

While this method is great, it has the drawback of having the growing medium retain harmful salts left over by the nutrient solution. You can combat this by replacing the nutrient solution with plain, pH-balanced water every four or five days. While this leaches out a large portion of the salts near the roots, it doesn't get rid of them—they simply migrate down to the bottom of the growing medium.

Another drawback to this method pertains to pests—an infestation of critters is extremely difficult to get rid of with the peat-and-perlite growing medium. This is because the uneven surface of the medium is rife with tiny crevices and holes, perfect sites for any critters to hide and reproduce in. If you have an infestation, you'll actually have to replace

the top inch or two of the medium to get rid of the hidden pests that take refuge there from insecticide. These moist hiding places also conceal insect eggs that can transform into the next generation of pests.

With this method, feeding plants is as easy as watering any other houseplant you may have. You can do it when you come home from work, or before bed. It's entirely up to you—just be sure to keep the growing medium moist but not extremely wet.

EBB & FLOOD

This is the method that I used to cut my teeth in hydroponics. The ebb-and-flood method uses a growing medium of pea gravel, sand or something of the like. There's a lot of flexibility here. The idea is to allow room for the roots to grow through the medium unimpeded. I've heard of people using everything from their childhood marble collection to aquarium gravel. Even rocks dug up from the driveway work (if you clean them well enough).

This method can be as complex or as simple as you want it to be. The most basic setup has a growing tray filled with the medium you've chosen, with a hose connected to the bottom of it. The other end of the hose is connected to the bottom of a bucket, which is used as a nutrient-solution reservoir. Fill the reservoir with the nutrient solution, and then lift the reservoir higher than the top of the growing-medium tray. The nutrient solution will flow from the reservoir into the tray, flooding the growing medium. Place the reservoir on the floor and the nutrient solution will flow from the tray back into the reservoir. Simple.

The major advantage of this method is that the roots are constantly moist and highly oxygenated. The solid, heavy growing medium—I recommend pea gravel—holds the roots better than do peat and perlite. There's also ample room between the grains of the growing medium for the roots to grow almost entirely unimpeded. They'll waste less energy trying to plow through the medium, making an extensive early root system. This lends itself to spectacular results later on.

One drawback to this method is that the tray has to be flooded three to four times daily, religiously. If you have a job, then your plants will suffer because you won't be able to feed them sufficiently. This is a good reason to explore automating your ebb-and-flood setup. Use a pump to fill the tray, a float switch to signal when the tray is full and an electric valve that opens to allow the nutrient solution to flow back into the reservoir. An electric timer is also a must-have for this system.

You might be scratching your head trying to figure out how to implement this. Don't worry: There's a clever solution to this problem. Read on.



@VAPEVESPER



Plants grown hydroponically experience explosive growth rates.

AERATED SOLUTION

If you want to use the ebb-and-flood method because of all of its perks, but you're not home during the day and you're not good with electrical things, here's your solution: Use the same growing tray and medium as you would with the ebb-and-flood method, but don't use a reservoir. With this system, the reservoir is replaced with an aquarium aerator. Hoses from the aerator are snaked along the bottom of the growing tray, and then the tray is filled with your growing medium.

The idea is to have the growing tray constantly filled with the nutrient solution (and growing medium). The aerator blows air through the perforated hoses on the bottom, keeping the nutrient solution from becoming stagnant. This process is known as aeration, and it's what keeps the goldfish alive in your aquarium. The rising air bubbles circulate and provide a constant flow of the nutrient solution to the roots of your plants.

With a setup like this, you need only to check for critters every now and then and to replace the nutrient solution once or twice a week. It is the best solution for the working grower, providing absolutely amazing results with minimum complications. I've used this setup since figuring it out nine years ago, and I have absolutely no complaints. The pleasant hum of that aerator puts me to sleep at night.

NUTRIENT FILM TECHNIQUE

The nutrient film technique (NFT) is widely used in commercial operations because it is completely scalable, and it provides amazing results. You can expand your NFT system to cover acres of growing area if so inclined.

Basically, the nutrient solution constantly flows through a flat-bottomed tray or a wide, round pipe (PVC plumbing pipes work excellently for this). The solution is allowed to flow over the roots of the plant, delivering nutrients very efficiently. Because the plant roots are sitting in fast-flowing water, a large amount of oxygen is also delivered to them. Most NFT growers also aerate the nutrient solution in the reservoir to further increase its oxygen content.

No growing medium is used, so the roots expand at a phenomenal rate and amazing growth follows. Some common (legal) crops that are grown using this technique in commercial settings are tomatoes, cucumbers, peppers, zucchinis and even pumpkins.

While the advantage of this system is its phenomenal growth and infinite scalability, the foremost drawback is its complexity. To implement this technique, you need a high-flow pump, an aerator and a complicated network of piping or trays. The results are spectacular, but many feel the complexity and level of work involved aren't worth it.

Another drawback to this method is the expense of setting it all up. The costs of a pump, aerator and assorted pipes add up quickly. It's also very unforgiving with mistakes or oversights, which will cause headaches later on.

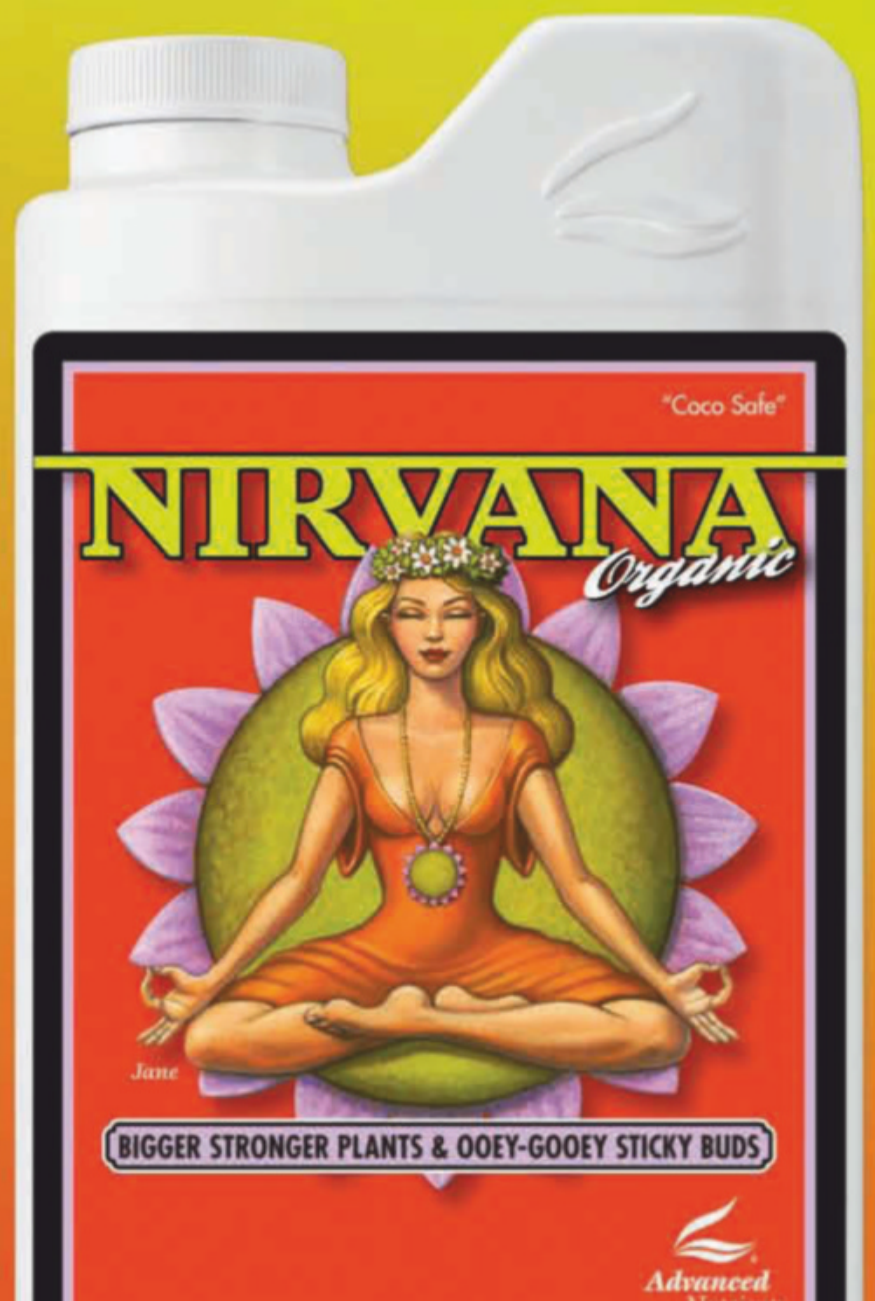


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Roots expand quickly when misted with aerated nutrient solution.

AEROPONICS

This method is a spin-off of NFT, and the setup is almost the same. What changes, though, is the method of delivering the nutrient solution. Instead of having it flow over the roots, the solution is blown on the roots in a fine mist via a special nozzle, much like the fuel injector on your car. This method is still quasi-experimental, and it isn't used very often. A major consideration is cost. Another factor is that no way (so far) has been found to keep the nozzles from getting clogged due to nutrient crystallization.

AQUAPONICS

Aquaponics sounds like a no-brainer, but it's actually the most involved way to grow hydroponically. It is a natural hydroponic method, using next to no processed chemicals. I'm mentioning it here only to be complete, though, as you wouldn't actually use it in practice to grow your grass.

Basically, a crop is grown in a hydroponic solution (a growing medium is optional).

The nutrients for the solution are obtained by natural means, such as harvesting the effluent from a fish tank (an extremely rich source of the constituents used in regular, nonnatural hydroponics). The system has the benefit of being almost self-sustainable, but it's extremely involved and labor-intensive to set up and maintain.

I highly doubt that marijuana has ever been or will be grown using this type of setup, but I felt I should mention it anyway.

SOME CONSIDERATIONS

While cost is always something to keep in mind, your skill level as a grower is also something that you must consider. First-time growers should use the peat-and-perlite method. This allows you to learn and to improve your grow skills using a very simple and forgiving hydroponic method. While the results won't be as spectacular as you'd see when using some of the other methods, it's still a very effective way to grow. You won't be disappointed.

Another consideration is location. Are you growing in a closet or a basement? Or do you have a dedicated room for your grow? A shed or garage, maybe? With seasoned growers that use only a closet or corner of their basement, the ebb-and-flood or aerated-solution methods should be used—NFT and aeroponics need space and are high-maintenance.

Be realistic about your requirements, space being the first thing to consider and therefore the deciding factor. If you want to squeeze your system into an area barely big enough for it, think about fixing a leak in a pipe with only a few inches between it and the wall. Not good.

Now for cost. The cheapest system I've outlined is the peat-and-perlite method, though I recommend the aerated-solution or ebb-and-flood method if you can swing it. The mild increase in cost is far outweighed by the results and the lack of headaches.

So those are the common hydroponic methods in a nutshell. I hope it will be useful to you. Best of luck in your growing endeavors! 🌿

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EXPERT LIGHTING ADVICE

Cannabis plants get inspected in a massive garden lit by LEDs.



INVESTING IN THE LATEST AND GREATEST TECHNOLOGY CAN HELP YOU TAKE YOUR GROW TO THE NEXT LEVEL. HOWEVER, IT CAN BE DIFFICULT AT TIMES TO KNOW WHICH LIGHTS ARE WORTH INVESTING IN. WE SPEAK TO MARTIN ANKER FROM SANLIGHT TO BETTER UNDERSTAND WHAT TO LOOK FOR IN A GROW LIGHT AND HOW LIGHTING CAN INCREASE YOUR YIELDS. *BY STONEY TARK*

How did you first get involved with horticultural lighting?

Almost 20 years ago I started as a hobby grower. I was growing on just a few square meters with HPS [high-pressure sodium] lights. As my grow setup had to be as stealthy as possible, I realized that temperatures in small cabinets are a big issue to control. A few years later I started mechatronic studies under a master's program, where I decided to combine my hobby of growing with my technical knowledge, and eventually founded SANlight.

What's most important when considering a grow lamp?

Many different points have to be considered, and the first question is where you want to use your grow-light system. For usage in big professional facilities or greenhouses, the protection of LEDs [light-emitting diodes] is important. So you need at least IP54 protection class. Especially if the grower is working with sulfur, the protection is very important, as sulfur can destroy your LEDs.

For sure, the PPF and PPFD [photosynthetic photon flux and photosynthetic photon flux density, respectively, which are measures of photons that contribute to photosynthesis] values are most important in general. A grower should have at least the same PPF and PPFD readings as with their old HPS system. A few percentage less PPFD can be compensated by the better spectrum, however over 15 percent less PPF/PPFD will lead to smaller crops. For example, a 600-watt HPS SE [single-ended] fixture has around 840 $\mu\text{mol/s}$ PPF, so your LED system should have the same or more PPF to be a good replacement.

Light spectrum is important also, and narrow-banded spectrums with just red and blue LEDs will lead



Anker's lighting technology works for a variety of plants.

“Home growers especially can benefit from using LEDs as lighting for their grows. Growing with LEDs means a grower can produce a larger yield in the same cultivation area.”

to saturation effects on chlorophyll when used at high intensities greater than 500 $\mu\text{mol/m}^2/\text{s}$. Such PPFD values are typical for growing cannabis indoors. Last but not least, a grower has to check for passive-cooled fixtures and the lifetime of the whole fixture's good secondary optics. As the LED technology is rapidly moving forward, a grower would benefit from an upgradeable fixture, saving the grower money in the long run.

What is the difference in the brightness of a lamp and the PAR output?

Brightness is measured in lumen and lux. On the other

hand, the human eye can see green light best, which is the measurement of lumen—the sensitivity of the human eye. Due to the technology nowadays, most HPS bulbs have the same spectral output. Therefore, a grower can compare HPS bulbs by lumens even though it's not the right measurement.

To evaluate light sources for horticultural applications, you have to know that you can look at light in two different ways. One perspective is to look at light as a wave—then we are talking about PAR watts. The other point of view is to look to light as particles [photons]—then the measure is $\mu\text{mol/s}$,

which means we are counting the photons. If we are talking about PAR watts, you have to know that the energy of a light wave depends on the wavelength—the shorter the wavelength, the higher the energy from the light wave. Our internal research has shown that measuring photosynthetic active radiation is done most exact by measuring in photons [$\mu\text{mol/s}$ for PPF and $\mu\text{mol/m}^2/\text{s}$ for PPFD].

Which spectrums of light do plants really use during their life cycle?

That's not an easy question to answer, as the research for that is at an early stage. In general, my answer is the best spectrum for plants is emitted by the sun. It's possible to design a sun-like spectrum with LEDs, but lifetime and efficacy are not good with today's technology.

Whether or not a spectrum performs well or poorly

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Cannabis plants
thrive under the
right spectrum.



should be the primary concern along with the intensity at the plant [PPFD]. For low intensities with $50\mu\text{mol}/\text{m}^2/\text{s}$ to $200\mu\text{mol}/\text{m}^2/\text{s}$, narrowband spectrums with just red and blue work fine. Such intensities are used, for example, in greenhouses as a supplement to the natural daylight. If you want to grow short-day plants in an indoor facility, a grower needs high intensities, e.g., $500\mu\text{mol}/\text{m}^2/\text{s}$. For that application, a more broadband spectrum works better by preventing saturation effects. We are trailing different spectrums at different intensities continuously, and up to today our actual spectrum performs best for indoor cultivation at high PPFD readings.

How does red and far red influence flowering and why does this happen?

Having the right ratio of red and far-red light is important for rooting and the development of side branches. Without enough far-red light in the spectrum, side branches will stay very short, which leads to a reduction of yield at the end of your grow. Also, the root development of clones and seedlings is influenced by the red/far-red ratio.

Pure far-red light can be used to manipulate the maximum lighting time for flowering. Generally, short-day plants start flowering when the light cycle is 12/12. With additional far-red light at the end of the day, plants will start flowering even at 14 hours of light per day. So a grower has two hours per day more to power up the crop with light energy. But in my opinion, this is

not the way to go, because it's tricky to find the right amount of far-red light for different strains.

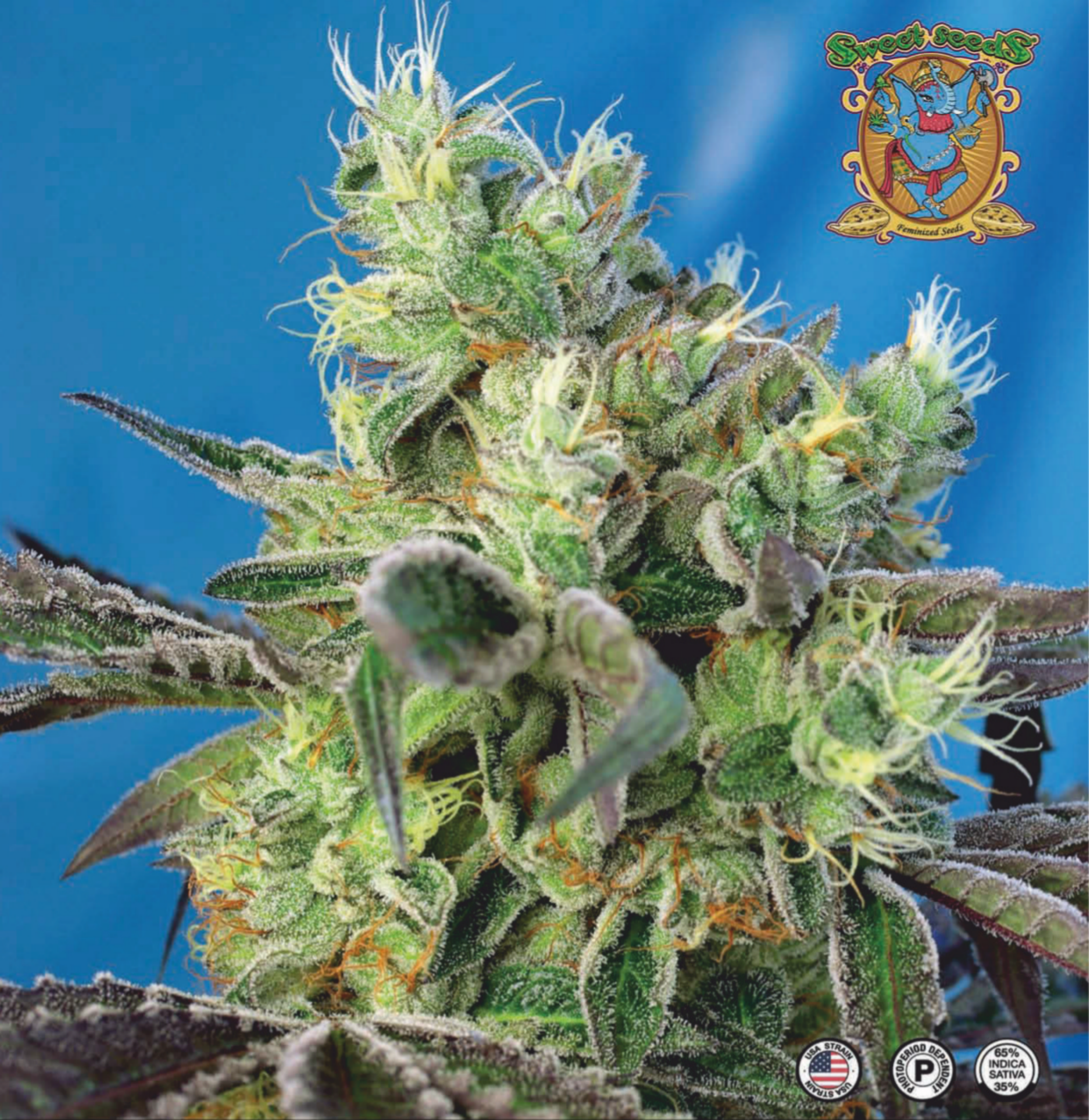
What are your thoughts on COB [chips on board] lighting and its overall efficacy?

COBs are good in terms of efficacy but are definitely not market-leading. It's an easy way to build up DIY lamps. As COBs are silver-coated, they are not useful for professional horticulture lighting, because the silver coating will be destroyed by sulfur in a very short time period. The COB will still function, but the PPF will drop dramatically. In professional indoor farms, sulfur is used to prevent pests and fungal attack.

How exactly do lighting manufacturers test for PPF and PPFD readings, and how accurate will those readings be?

Measuring PPF can be done in an integrating sphere or in a goniometer. Once a manufacturer has this equipment in his facility, the measurements can be done easily. Of course, the measuring process itself has tolerances up to plus or minus 7 percent.

PPFD measurements are also easy to do if you have the right equipment. We have seen in the past that cheap PAR meters have measurement errors up to 30 percent; however, if you use the right equipment, the measurement can be done quickly. It's important to measure over the whole area, and not just give a single value for a certain area, meaning it is best to have a PPFD plot over your growing area.



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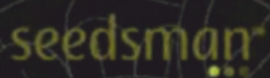
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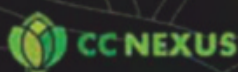
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Are LEDs more environmentally friendly, and can you describe the popularity of LED lights in Europe and how things have changed over the years?

Yes, on the one hand, the lifetime of LEDs is much longer than with HPS. This eliminates changing of the light source and, of course, reduces waste. Alternately, LEDs do not contain heavy metals like quicksilver. When I founded the company in 2012, it was hard to sell LEDs to the public. People doubted this technology, because a lot of cheap LED fixtures on the market produced bad yields in terms of quantity.

For SANlight, it was important to tell the people what's possible with LEDs and what's not possible. Today's technology can save up to 40 percent energy while producing the same yields, with the quality of end product being better if you grow with LEDs. That means you have more THC and CBD in your harvest, and the terpene profile is better too, because of lower heat radiation. In German-speaking countries, growers have realized that. Home growers especially can benefit from using LEDs as lighting for their grows. Growing with LEDs means a grower can produce a larger yield in the same cultivation area.

How is the scene in Europe regarding CBD, as we saw you are involved with a large-scale project in Switzerland?

CBD production is a big industry in Switzerland, and many farms are equipped with SANlight LED fixtures. Using LEDs in professional growrooms reduces the need for air conditioning, makes it possible to grow cannabis in a vertical farm, and increases crop yield and quality. Many professionals believe that LED technology is a key factor to operating their farms more profitably.

Do you feel that more growers will turn to LEDs as laws start to become more relaxed around the world?

Yes, I believe in that. Also, as the LED technology has higher initial costs, people could be afraid to lose their lighting system if something goes wrong. As laws change in favor of legal growing, growers will not have to worry as much about their grows being in jeopardy and could be more willing to invest in the technology for the long haul.

What are your top tips for anyone who wants to get the most out of their grow light?

A couple things. In our research, we have seen the importance of VPD [vapor pressure deficit]. And, of course, checking for temperatures above 23°C in combination with the right humidity is a key factor for good results with LEDs. Feeding and any other factors that influence plant growth can stay the same as with HPS. The only thing that changes is the needed amount of nutrient solution per day.

Do you have any social-media platforms our readers can follow you on?

Yes, you can find us on Facebook and Instagram (@sanlight_led). ✨



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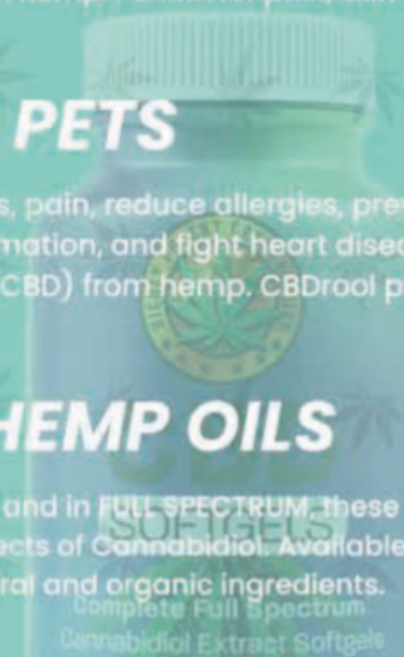
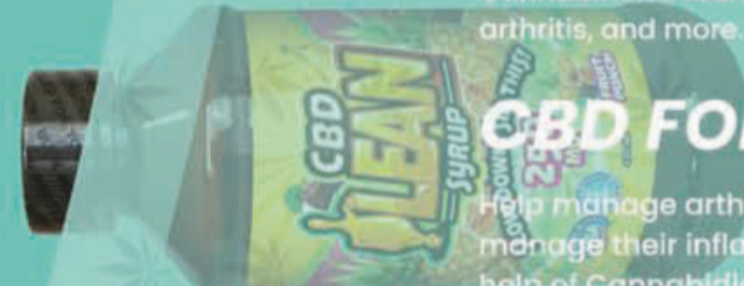
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CANNABIS DELIVERY GOES HIGH TECH

DROP-OFFS GET FASTER AND MORE ACCURATE THANKS TO SOFTWARE.

BY OLIVER ESTREICH, FOUNDER OF THE NATIVE SOCIETY

ONCE UPON A TIME, you might have gotten away with delivering weed two hours late. But these days, punctuality and accuracy will make or break a cannabis business.

The solution? Integrate with a software platform such as GetSwift that manages order flow and optimizes delivery over the so-called last mile, or final stretch of a route, to make sure packages arrive mistake-free and on time.

That's according to Bobby, co-founder and CEO of HERB, which sells a wide range of cannabis products and accessories. Bobby, who prefers to be known only by his first name, offers delivery in the Greater Los Angeles area including downtown, Echo Park, Silver Lake, Koreatown, Hollywood, Beverly Hills, Century City, Westwood, Santa Monica and Venice. Those regions are notorious for extremely heavy traffic, making customers all the more likely to want delivery rather than making the hike to a dispensary.

In its early years, HERB employed a crude system involving

texts to drivers (think of how marijuana continues to be sold and delivered in states where it's still illegal). But as HERB's business grew, such an approach became increasingly problematic.

"It was very cumbersome and prone to errors," Bobby says. "The delivery process involves so many small, coordinated movements that the delivery can go south quickly if one thing is missed."

The challenge became more complex as HERB expanded into multiple fulfillment centers across the Los Angeles area. With customers expecting delivery within about a half an hour, it became essential to know the absolute best routes, which is tough even for experienced drivers.

To solve the problem, Bobby wasn't interested in making big internal investments. "We didn't want to get into the delivery service business, so we searched for a software platform," he says. "We met Joel MacDonald, and we got onboarded."



MacDonald is founder and president of GetSwift, a software-as-a-service (SaaS) company based in New York. The business was founded in Australia as a solution for MacDonald's liquor delivery service, a venture he began after a career in Australian-rules football.

Today, GetSwift operates in countries all over the world, supporting the efficient delivery of everything from pizza to flowers. "Our technology is ideally suited for cannabis delivery," MacDonald says. "We can optimize delivery routes, drivers and schedules for cannabis businesses, whilst enabling their end users to benefit from an ultra-quick/convenient delivery service with live tracking—just like they would when ordering their dinner at home."

Ultimately, a platform like GetSwift may be essential to keep up with customer expectations. "The big frontier for e-commerce right now is optimizing the customer experience," MacDonald says. "If you aren't doing that, you are

probably already falling behind."

When it comes to cannabis orders, Bobby says that customers are perhaps even more demanding. "Delivery for our customers is about convenience," he says. "If you mess up, how many times are you going to be given a chance?"

Bobby says the delivery process became "tremendously easier" once he synced up with GetSwift. "The number of errors immediately declined and so did the delivery time," he says.

Drivers also benefit from a simplified platform. With GetSwift, they simply install an app that connects them with the dispatcher, who controls the order book. Drivers follow optimized delivery routes and drop off packages according to easy-to-understand instructions on the app.

Bobby says he was pleased that he didn't need to make a major up-front investment in any new hardware. Instead, GetSwift provides software and charges based on the number of deliveries.

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From a legal perspective, companies like HERB must be careful about keeping compliant... Even after recreational use in California became legal, laws continue to evolve. For instance, motorcycle delivery was recently banned, making it tougher for HERB to keep a tight delivery schedule.

"It's absolutely affordable," he says. "I have shopped around and been unable to find a better solution."

From a legal perspective, companies like HERB must be careful about keeping compliant. Bobby says he needs a particular retail license that allows for delivery. "It's not like starting any other business," he says.

And even after recreational use in California became legal, laws continue to evolve. For instance, motorcycle delivery was recently banned, making it tougher for HERB to keep a tight delivery schedule.

Bobby says he has been able to make adjustments to his platform to keep compliant. "The GetSwift platform will do what you tell it to do," he says. "You just have to customize it."

All of the benefits of a software platform are critical to keep

up in an environment where many illegal sellers remain in the game. "We see a lot jumping in illegally," Bobby says.

Cannabis attorneys say software platforms are inevitably going to become integral to marijuana delivery as legalization passes in more states. "As regulations shift and people become more facile with online, you'll find a shift toward software to support delivery optimization," says Joseph A. Bondy, one of the nation's preeminent cannabis attorneys. "It's just like getting a pizza."

Bondy also says that a SaaS platform has the potential to do even more using the data collected from each customer and order. "Over time, you'll begin to aggregate metrics on the people you deliver to," he says. "Using that data, you'll be able to proactively suggest orders rather than wait for them." ✨

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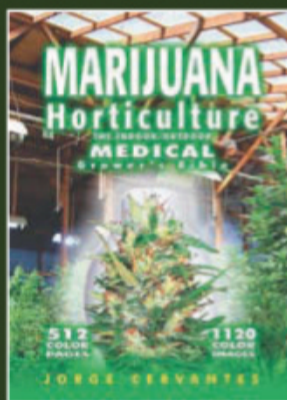


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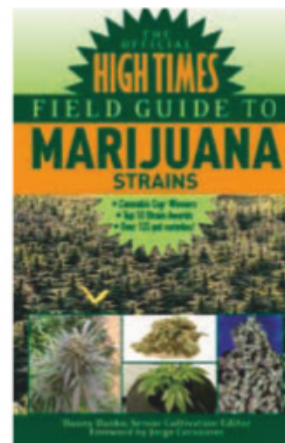


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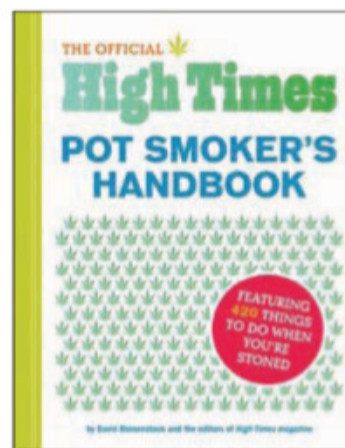
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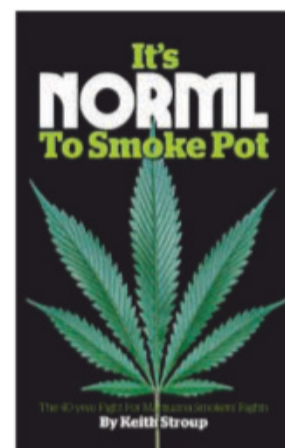
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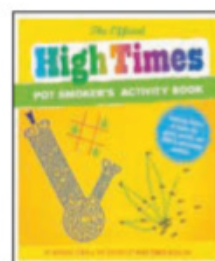
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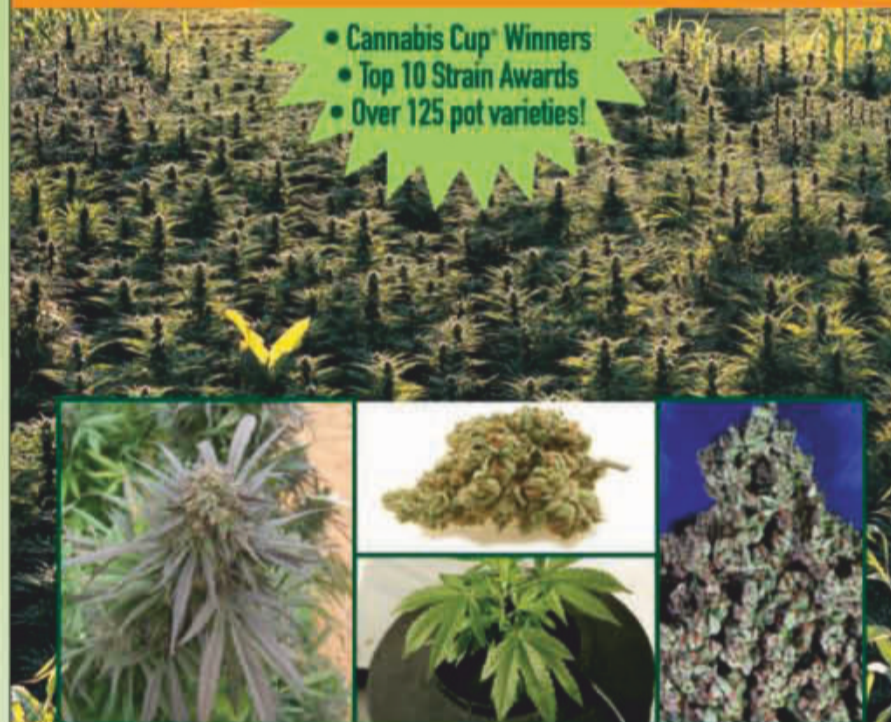
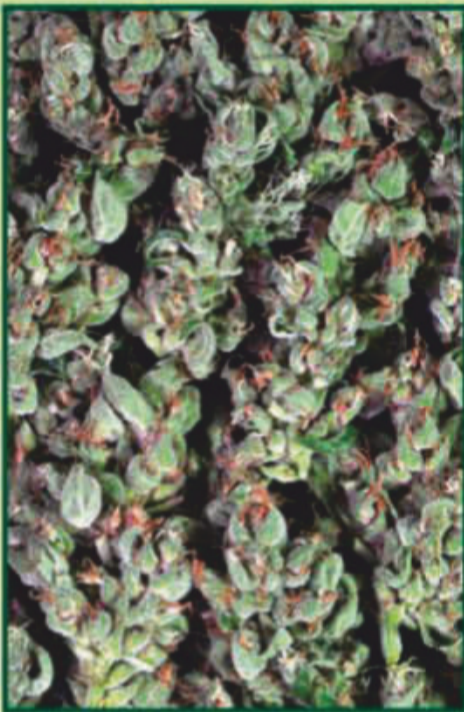
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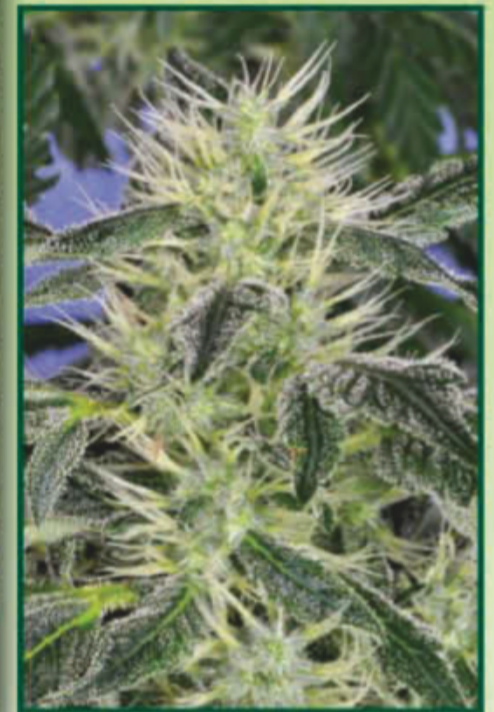


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SUBJECT: **Odor Control**

FROM: **Rob G.**

🌿 I live in an apartment and have a legal prescription for medical marijuana. I am concerned about the smell, though, if I decide to grow my own. What about grow tents or anything else for maximum discretion in terms of cost and practicality?

Dear Rob,
Odor control is an important part of cannabis cultivation, particularly as you approach harvest and during the drying process when the smell of your medical marijuana will permeate the surroundings. My advice is to

use a strong inline fan to exhaust all of your “spent” warm air through an activated-charcoal filter.

Filtration will eliminate much of the odor as long as you’re pumping out enough air to cause negative pressure within your grow area. This means the amount of air being expelled from your garden will pull in fresh air though any cracks and thus keep odors from escaping from your grow space.

A grow tent is a good and affordable way to accomplish this, and most of the ones I’ve seen already have built-in vents and some even come with a fan and filter. If you’re not growing perpetually, you can use the tent as a drying chamber and take advantage of the filter during this most odiferous of times.

These Purple
Punch colas
produce plenty
of odors.



Danko Tip: When growing indoors in winter, elevate your plant containers and reservoir above the floor to avoid damaging roots with cold water.



Motherplants In hydroponic systems need plenty of room for their roots.

SUBJECT: Hydro Mother Plants

FROM: Alan

🌱 **What is the best hydroponic method for long-term growth for mother plants?**

Dear Alan,
I usually recommend that people grow their mothers in soil or coco because those mediums are more forgiving over long periods of time. Also, plants grow more slowly in soil, so unless you need clones all the time, you won't have a huge, unmanageable tree to trim continually.

However, if you do choose the hydroponic route for your mother plants, my first recommendation would be to utilize the deep-water-culture (DWC) technique. This allows plenty of space for roots to

grow, and the greater amount of water it employs allows you to change out your reservoir less frequently.

Most hydroponic systems are built to grow more than one plant, but DWC can be easily used to grow a massive bush with plenty of branches and shoots from which to take clones. Just make sure you completely change the nutrient solution at least every two weeks, taking care to make sure it doesn't get too warm or cold.

SUBJECT: Yellow Leaves

FROM: AK

🌱 **My plants have slightly yellowed leaves, but I seem to have my pH at the level it should be—around 6-6.5. Is this a problem, and, if so, how can I fix it?**

Dear AK,

It sounds like your plants are suffering from a nitrogen deficiency. Because the pH is within the normal parameters, this is an easy problem to diagnose and treat. If the pH was over or under the recommended levels, I would suggest that you might need to fix the imbalance first, but at 6-6.5, all signs point to a lack of nitrogen.

You can provide your plants with a boost of nitrogen in a number of ways. If you're using bottled nutrients, add a healthy dose from the bottle labeled "Grow" or "Vegetative" with a high first number in the NPK (nitrogen, phosphorus, potassium) rating. Otherwise, you can use organic additives such as liquid seaweed, liquid fish or seabird guano. You should see your plants green up within a few days to a week after application.

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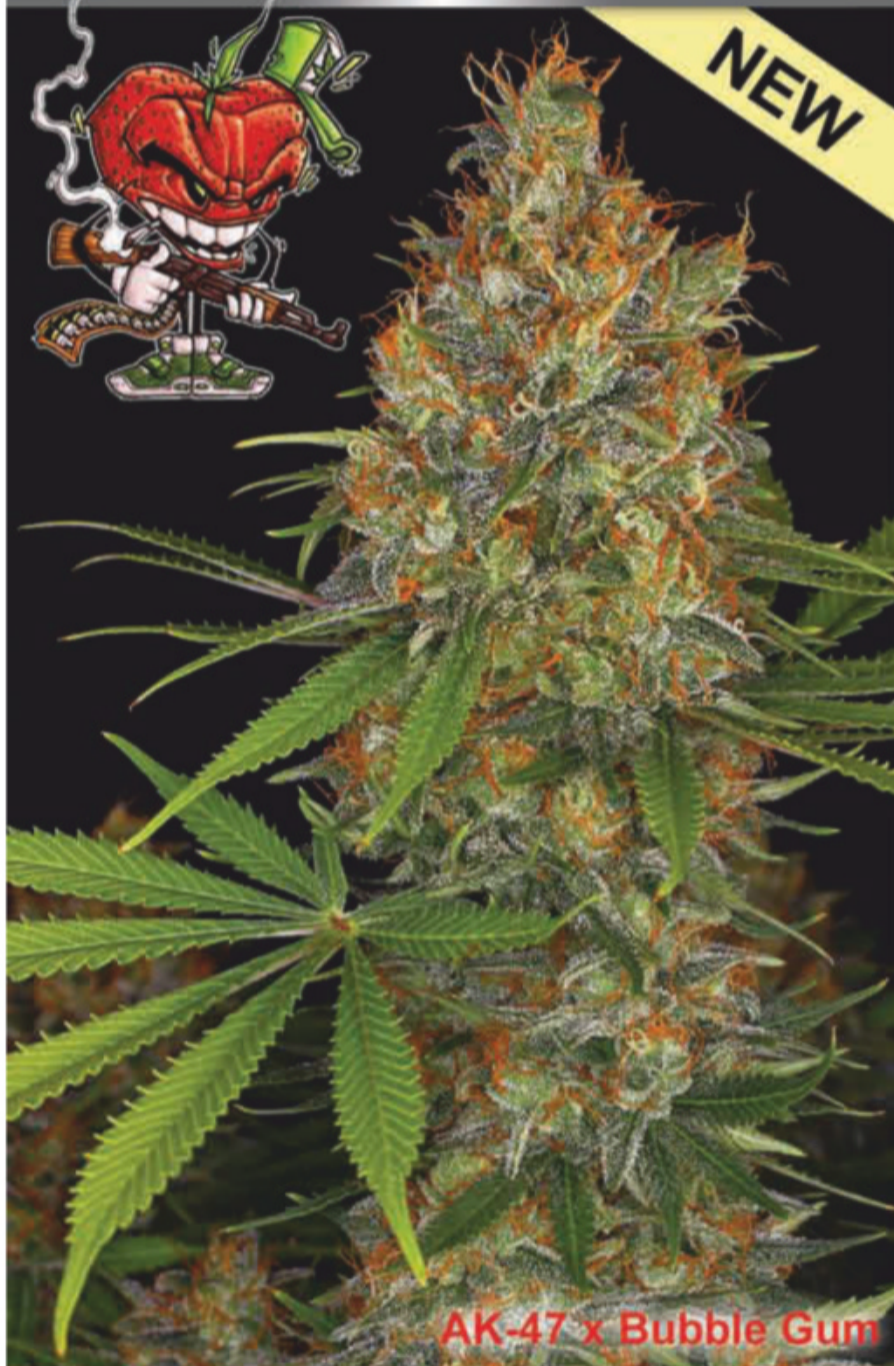
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DEAR DANKO

Danko Tip: Any yellow or brown leaves should be removed from your plants to prevent pests and mold.

SUBJECT: **Seedling Stretch**

FROM: **Joshua B.**

🌱 Sprouting seed has been easy for me, and transferring it to soil has been fine too. My problem is that the seedlings all grow straight up 6 inches or more before their weight causes them to fall over. I have a plant light that I run properly. What is the issue? Am I not planting seeds deep enough, or is it something else?

Dear Joshua,

My initial diagnosis is that your light is too far away from your plant tops. This is usually the reason that seedlings will stretch and then fall over. Adjust your light so that it is closer to your seedlings, and you should see this problem disappear.

If your seedlings are still alive, try to carefully remove the plant from its container and replant it with much of the stem buried in soil. To do this this, you should wet the soil, flip the container over with your fingers while protecting the stem and then gently remove the plant with the wet soil attached. Replant the seedling in a deeper container (or the same container, if you can and wish to do so), burying the stem nearly up to the first leaves. Some light airflow from a fan can also help strengthen the stems so that they are more able to bear the weight of the plant above.

SUBJECT: **Cloning From Vegging or Flowering Plants**

FROM: **Invictus Grower**

🌱 My crop is currently in the vegetative stage, and I'm almost ready to take clones. I have read about and seen the technique of taking clones from a mother or another plant while it's still in veg, but I've just stumbled across a technique called monster cropping—basically, taking a clone from an already budding/flowering plant in the first few weeks of flower and reverting it back to veg. Which technique is best—veg clone or monster-crop clone? I have done some research on monster cropping and it seems there's no definitive answer.

If monster cropping is best, is it better to cut the small popcorn buds off and make it look like a veg clone, or should I leave the small buds on? I have seen videos of both techniques, and when the buds are left on, the bud sites grow a crazy number of branches when the plant reverts to veg. I would love to hear your thoughts on veg cloning versus monster cropping.

Dear Invictus,

I do not advise taking clones from flowering plants. The extra time it takes to revert them back into the vegetative stage and the potential to stress out the plant and cause it to react with strange behaviors such as hermaphroditism or whorled phyllotaxis are too great. The healthiest cuttings come from strong and healthy vegetative plants, so feel free to take clones from your plants in veg but avoid taking clones from budding plants.

I'd only recommend taking a clone from a flowering plant to save genetics from being lost. If you've found a unique and amazing flowering plant and you want to keep it around to make a mother plant from it, take a clone, root it and place it under 18-20 hours of light per day. Eventually, it will revert



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DEAR DANKO

Danko Tip: Harvest your plants during the dark cycle to preserve terpenes and other essential oils at their optimum levels.

back to the vegetative state, allowing you to preserve its genetics for future use.

SUBJECT: **Plant Limits**

FROM: **Duke**

🌱 I'm considering changing the amount/size of plants in my grow-room. I'm running eight 1,000-watt lights and growing in soil in 10-gallon pots. Considering that I mostly raise Kush varieties, I'm wondering if I should grow more plants in smaller pots or if I should just stay with something similar to what I'm already growing. I've been averaging around .25 grams per watt, and I'm trying to get closer to .5. Thanks in advance for your help.

Dear Duke,
 The first thing you should consider when adding more plants to your garden is the legality of your grow. In most states, the more plants you have, the greater the penalties, and federal plant limits should also always be a consideration. So please do the research and find out how many plants you can legally grow or what the penalties are for your desired amount of illegally grown plants. *Norml.org* is a great resource to learn about the cultivation laws in your state.

Second, you should know that the fewer plants you grow, the longer your vegetative time will be to get the plants larger in order to fill up your space. When growing more plants that are smaller, you will have a shorter vegetative time and thus be able to harvest sooner. You also will have less time for something to go wrong along the way such as issues with overfeeding or pest infestations.

The best thing you can do to increase your grams per watt is to keep your environment totally controlled so that there aren't any fluctuations in temperature and humidity. Adding CO₂ gas injection also boosts yields. Avoid using plant-growth regulators as they are not meant for plants that we consume and they contain chemicals that have been deemed unsafe.

SUBJECT: **When to Induce**

FROM: **Zach R.**

🌱 I was wondering how to tell when it's time to switch to a 12/12-hour day/night light cycle.

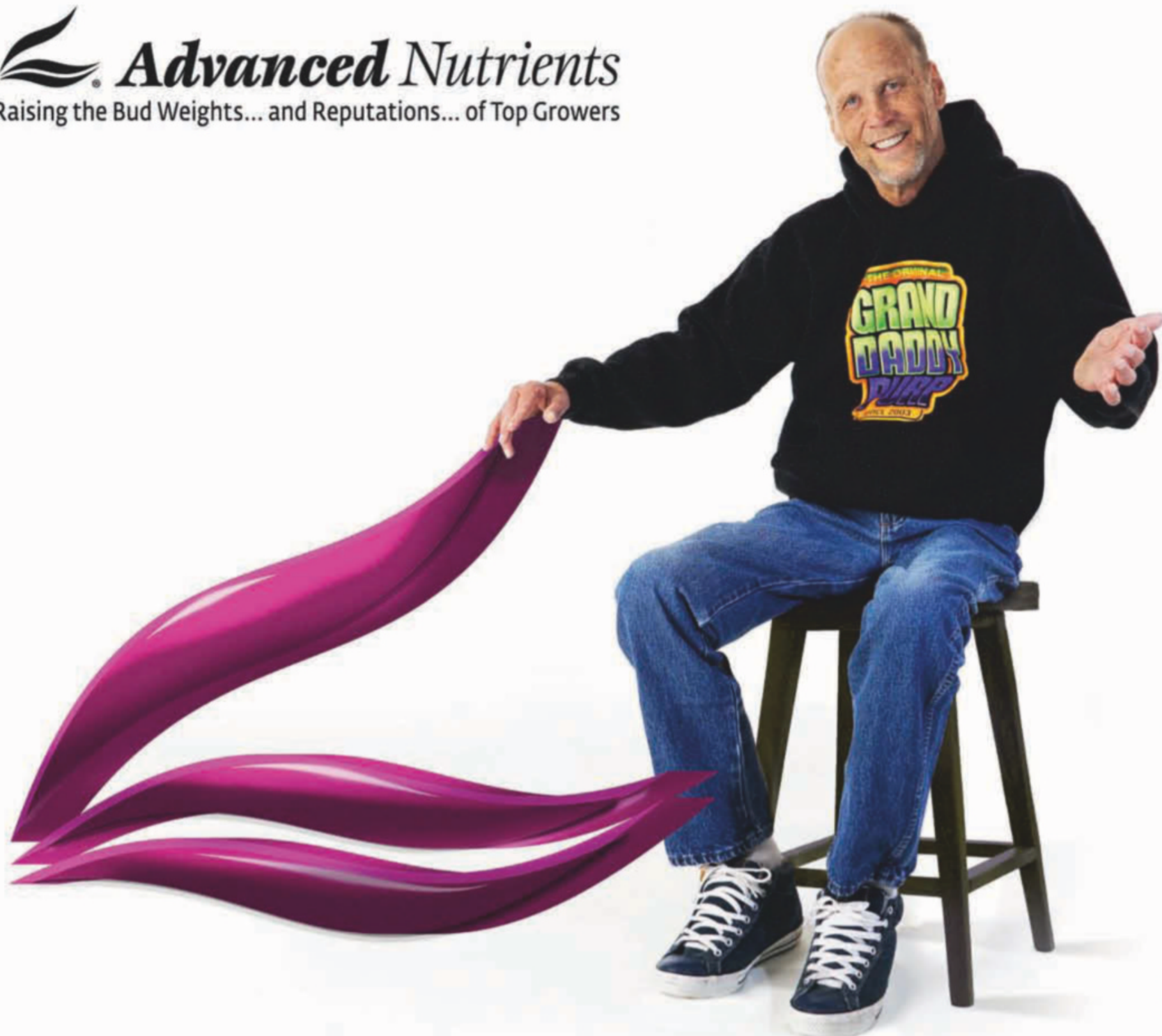
Dear Zach,
 The decision as to when to induce flowering in your plants is entirely up to you. It's important to determine how much space you have and to factor in the fact that your plants will stretch for at least a few weeks after flowering is induced. I usually recommend one week per gallon of container you use, so a plant in a 5-gallon bucket should get approximately five weeks of vegetative time before the switch. Plants in a 2-gallon pot need two weeks to vegetate.

The longer you vegetate your plants, the larger they will be, but that also allows time for things to go wrong. Overwatering, overfeeding and pest infestations have more of a chance to manifest into bigger problems, and your plants can easily become root-bound and end up not yielding as much. 🌿

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MANGO STICKY-ICKY RICE

ENHANCE YOUR HIGH WITH THIS TASTY THAI TREAT. BY JOANNA O'BOYLE

EVER HEAR THE old stoner rumor that eating fresh mango before consuming cannabis will intensify and prolong the effects of THC? This idea has been around for a while, and there is some science to back it up. Mangos naturally contain high levels of beta-myrcene, a monoterpene found in cannabis and other aromatic plants. Myrcene levels in cannabis are indicative of a strain's sedative effect—so more myrcene means more of a heavy, relaxing, couchlock high. But will eating mango enhance your high? It's time to find out for yourself with this easy-to-make mango sticky-rice recipe, which is a sweet-and-salty dessert commonly enjoyed in Thailand during the summer months (minus the cannabis). Whip some up and find out if the “mango effect” works for you.

As ever, when trying something new with edibles, go slow and see how your body reacts over several hours. Take it easy and enjoy!

INGREDIENTS

1 cup Thai long-grain sweet rice
(a.k.a. sticky rice)
1½ cups water
4-5 tbsp. brown sugar (to taste)
½ tsp. salt
1½ cups full-fat coconut milk
.3 grams 70 percent THC concentrated
cannabis or Rick Simpson Oil (RSO)
¼ tsp. (about two pea-sized drops) liquid
sunflower lecithin
2 ripe mangos

DIRECTIONS

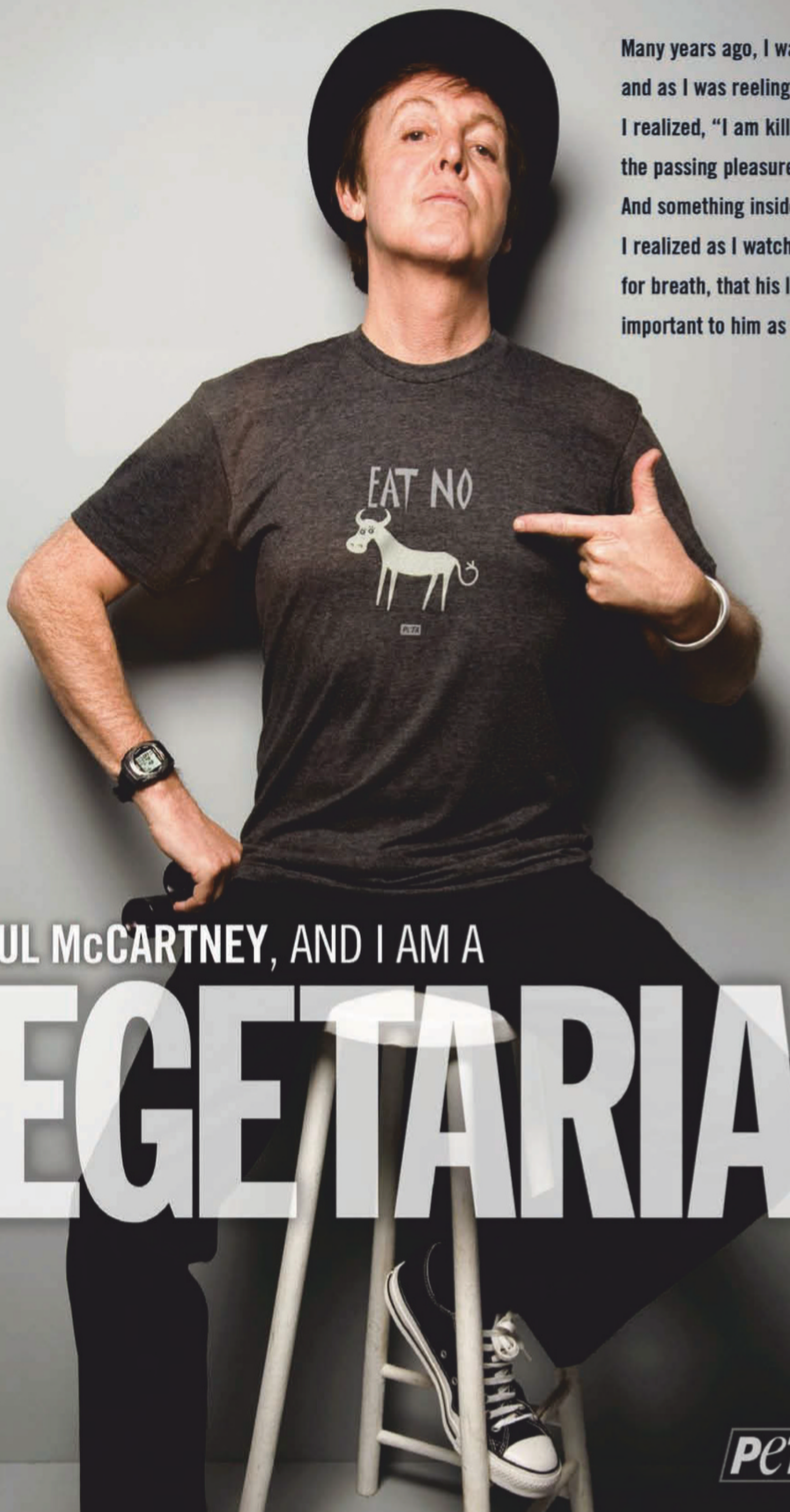
Soak one cup of sweet rice in a cup of water for 30 minutes or more. Add another half a cup of water, along with half a cup of coconut milk, half a teaspoon of salt and one tablespoon brown sugar. Stir thoroughly. Next, bring the mixture to a gentle boil over medium-high heat, then reduce heat to

medium-low, aiming for a gentle simmer. Partially cover the pot with a lid, allowing steam to escape. Simmer 10-15 minutes, or until the coconut milk has been absorbed. Then turn off the heat, but leave the pot on the burner with the lid closed. Allow to sit 5-10 minutes.

To make the sauce, warm the rest of the coconut milk (one cup) over medium-low heat. Whisk in three to four tablespoons of brown sugar (to taste) until it's dissolved. Whisk in the .3 grams of concentrate or RSO and the quarter teaspoon of liquid sunflower lecithin until evenly incorporated and no specks of oil are visible. Cover the sauce and let it cool for 5-10 minutes.

Peel and slice the mangos into bite-size pieces. Scoop a half cup rice into each serving bowl, divide and add the mango evenly, then pour in a quarter cup coconut sauce. Best enjoyed immediately. ✨

Photo © 2007 PETA Communications Ltd./Max Vadukul



Many years ago, I was fishing,
and as I was reeling in the poor fish,
I realized, "I am killing him—all for
the passing pleasure it brings me."
And something inside me clicked.
I realized as I watched him fight
for breath, that his life was as
important to him as mine is to me.

I AM PAUL McCARTNEY, AND I AM A

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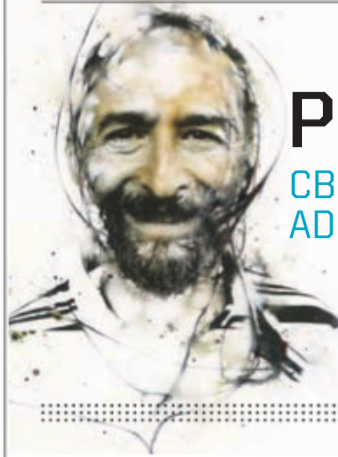


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Could your best bud benefit from CBD?

hear they don't. Which is it?

Chiba Serturner

Hello Chiba,
Medical-marijuana states that have dispensaries show meaningfully drops in rates of opioid addiction and opioid overdoses. Flimsy programs that do not improve the availability of the plant don't help. It's not enough to have a law on the books; you've got to get medicine to those who need it.

What's the deal with CBD for dogs?

Lil Bow Wow

Bow Wow,
The only published work suggests that high doses create sedation and diarrhea in canines, but that's about the worst of it. The medical effects aren't exactly well-documented, but I assume they're similar to the ones we see in humans. I should emphasize that the dosage required for a real decrease in anxiety or inflammation is probably going to be expensive.

Is marijuana really the most popular drug?

N. Vogue

Hey Vogue,
Usually, folks who say that mean "illicit" drug, a distinction that cannabis won't qualify for if we keep up the good work. Caffeine is used by more people and more often, and 70 percent of US citizens use alcohol.

One day I hear that states with medical marijuana have fewer opioid problems. The next day I

The wife says it's time to start a family and I have to put down the plant to get her pregnant. Is she right?

Si Gote

Hi Si,
Sperm in a petri dish don't swim as well with a high dose of THC, but studies of couples trying to conceive suggest that cannabis has little impact. It's a nice show of teamwork, of course, but probably not essential.

I swear that my new bud is a rocking mosquito repellent, but nobody believes me. Can you help me out?

Buzz Hoff

Howdy Buzz,
I've never seen it in action, but linalool, the major terpene in cultivars with lavender scents, definitely makes some bugs head for the hills. Fire away! 🌿

Dr. Mitch Earleywine, PhD, is the author of Understanding Marijuana and The Parents' Guide to Marijuana.



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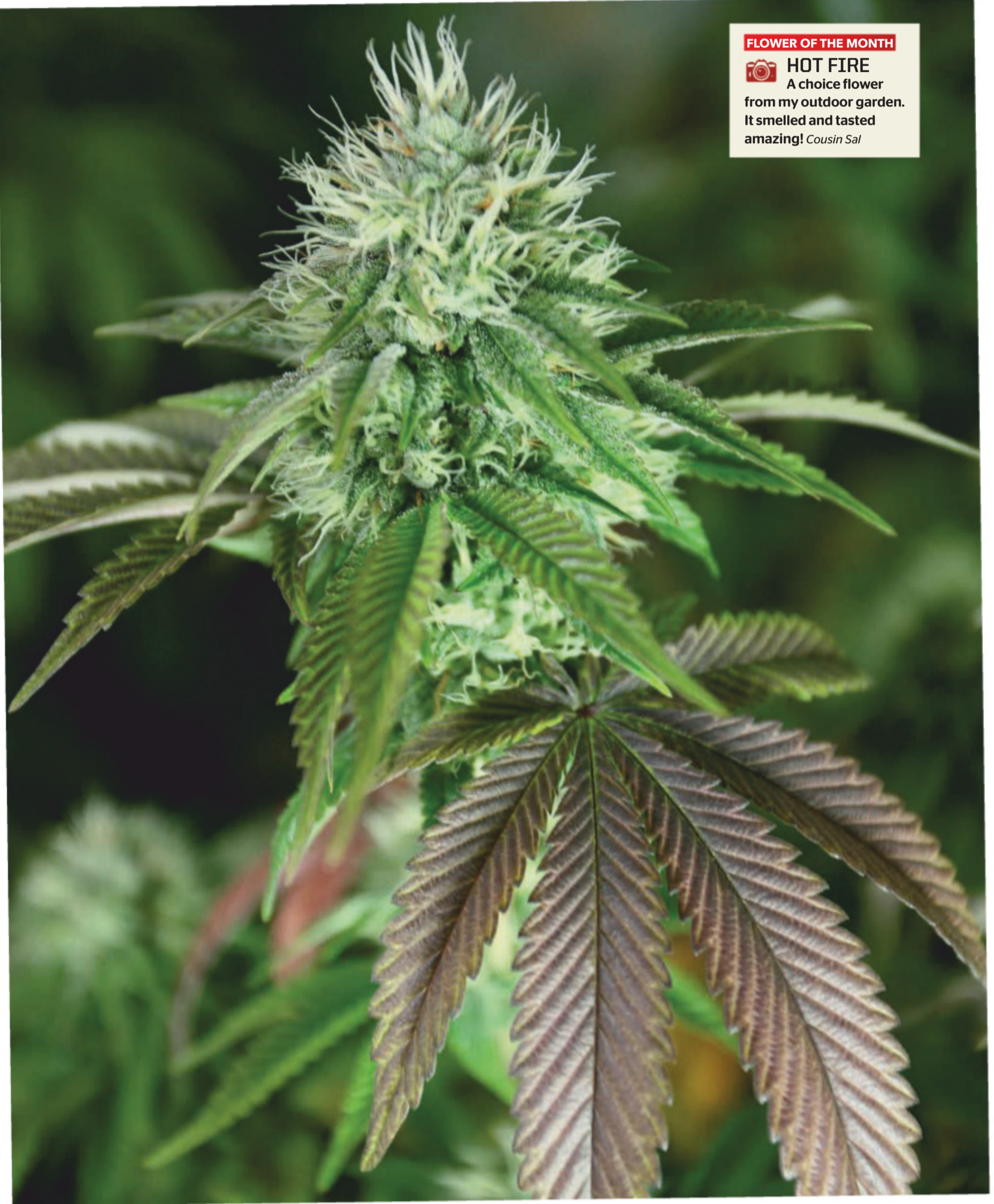
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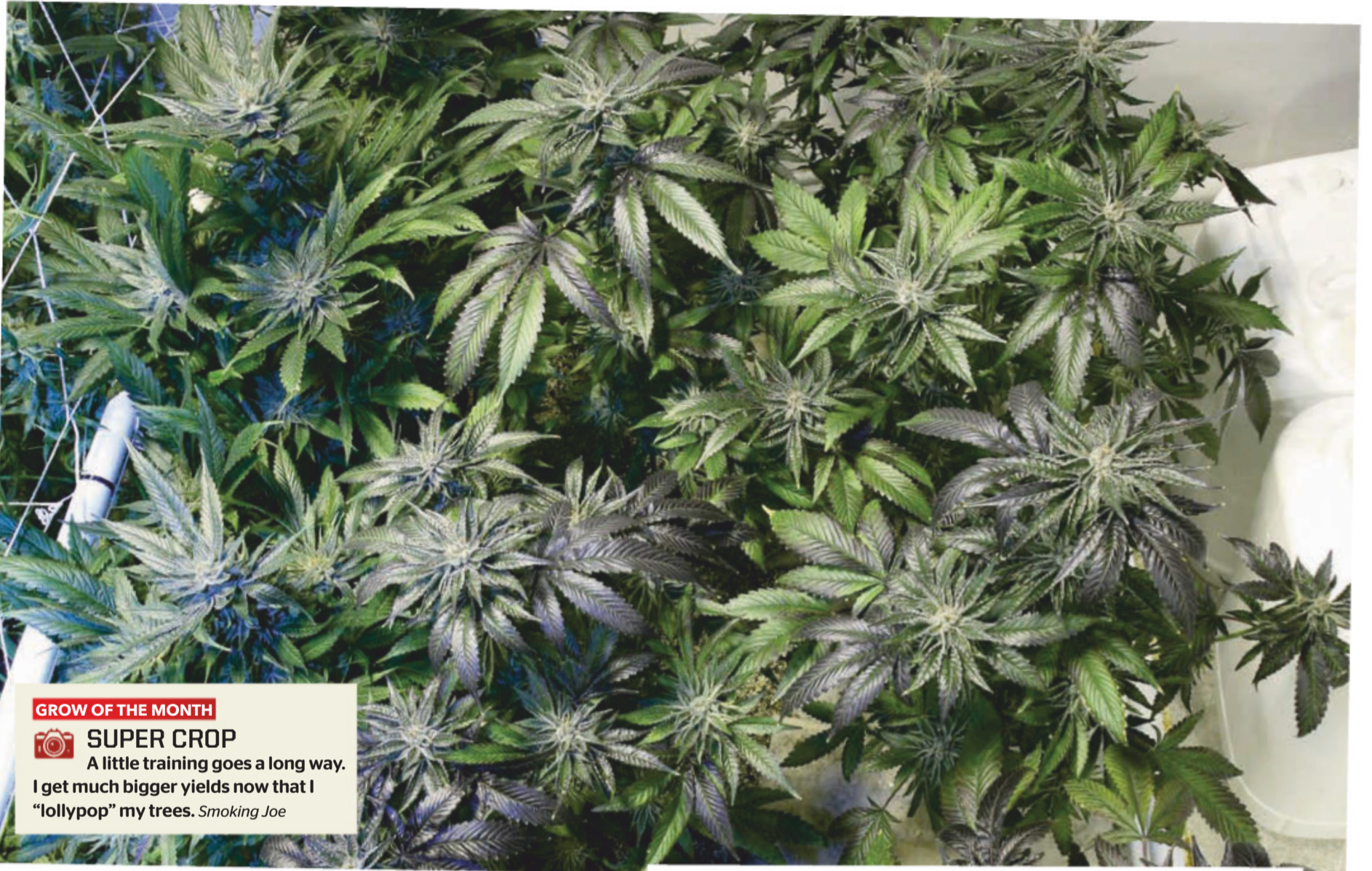
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Cheech y Chong





GROW OF THE MONTH

SUPER CROP

A little training goes a long way. I get much bigger yields now that I "lollypop" my trees. *Smoking Joe*



CLOSE UP OF THE MONTH

KING OF THE MONSTER BUDS

This is my Godzilla Glue. Hope you enjoy! *Silver Fox Bud Co.*



COLA OF THE MONTH

HOLD IT NOW...

I grew this beastly bud indoors under a 600-watt growlight. *Adam "Slop"*

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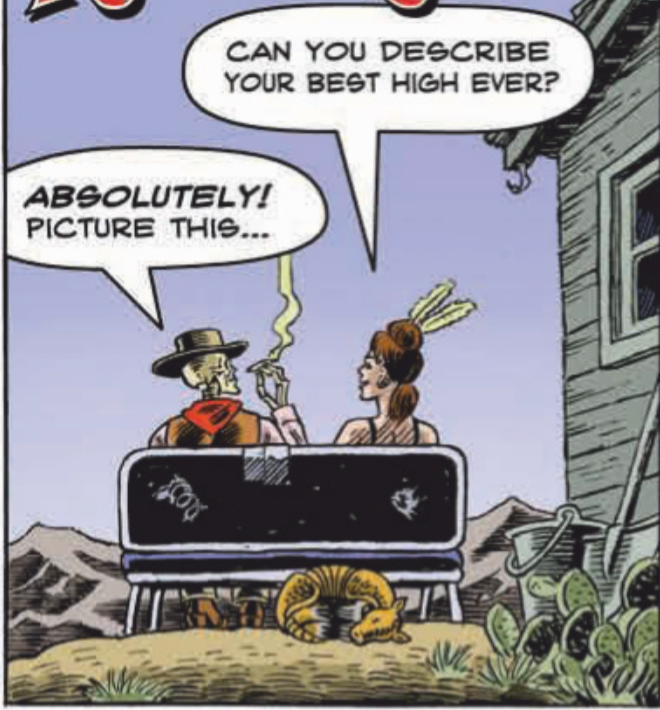
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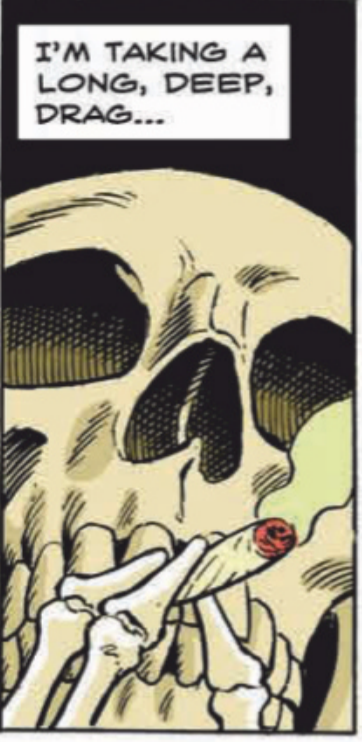


DOPE RIDER

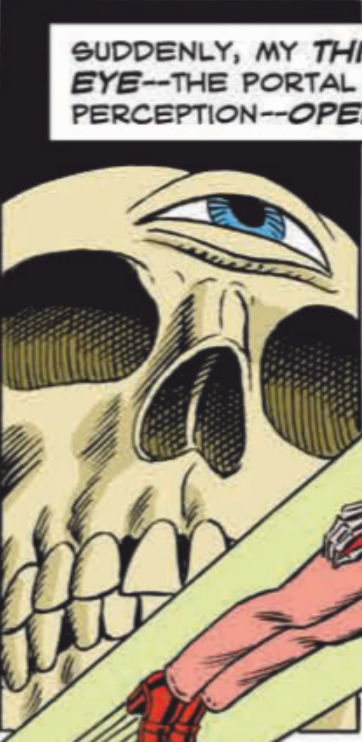


CAN YOU DESCRIBE YOUR BEST HIGH EVER?

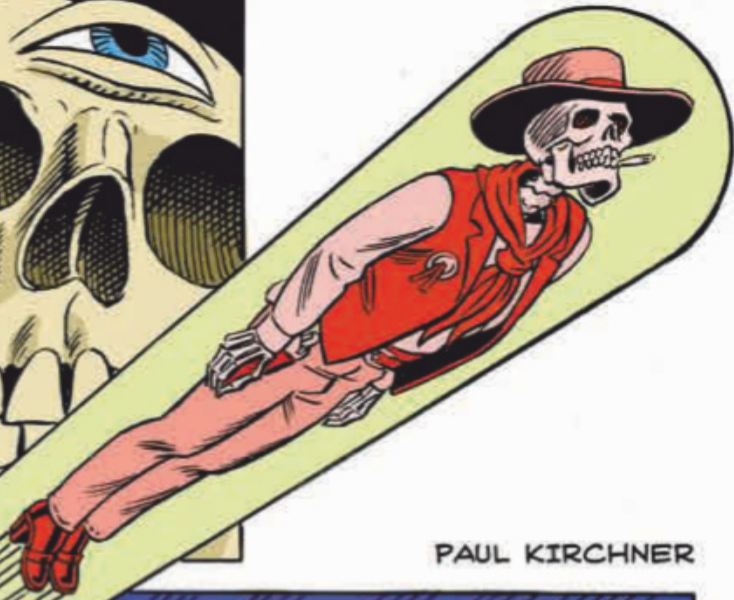
ABSOLUTELY! PICTURE THIS...



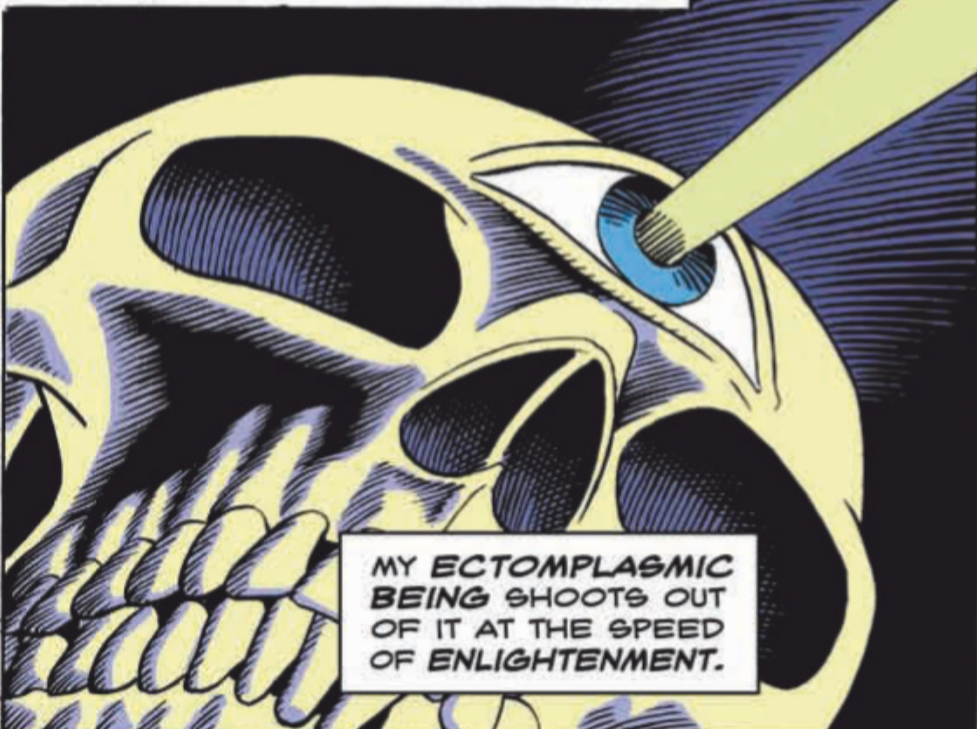
I'M TAKING A LONG, DEEP, DRAG...



SUDDENLY, MY THIRD EYE--THE PORTAL OF PERCEPTION--OPENS.



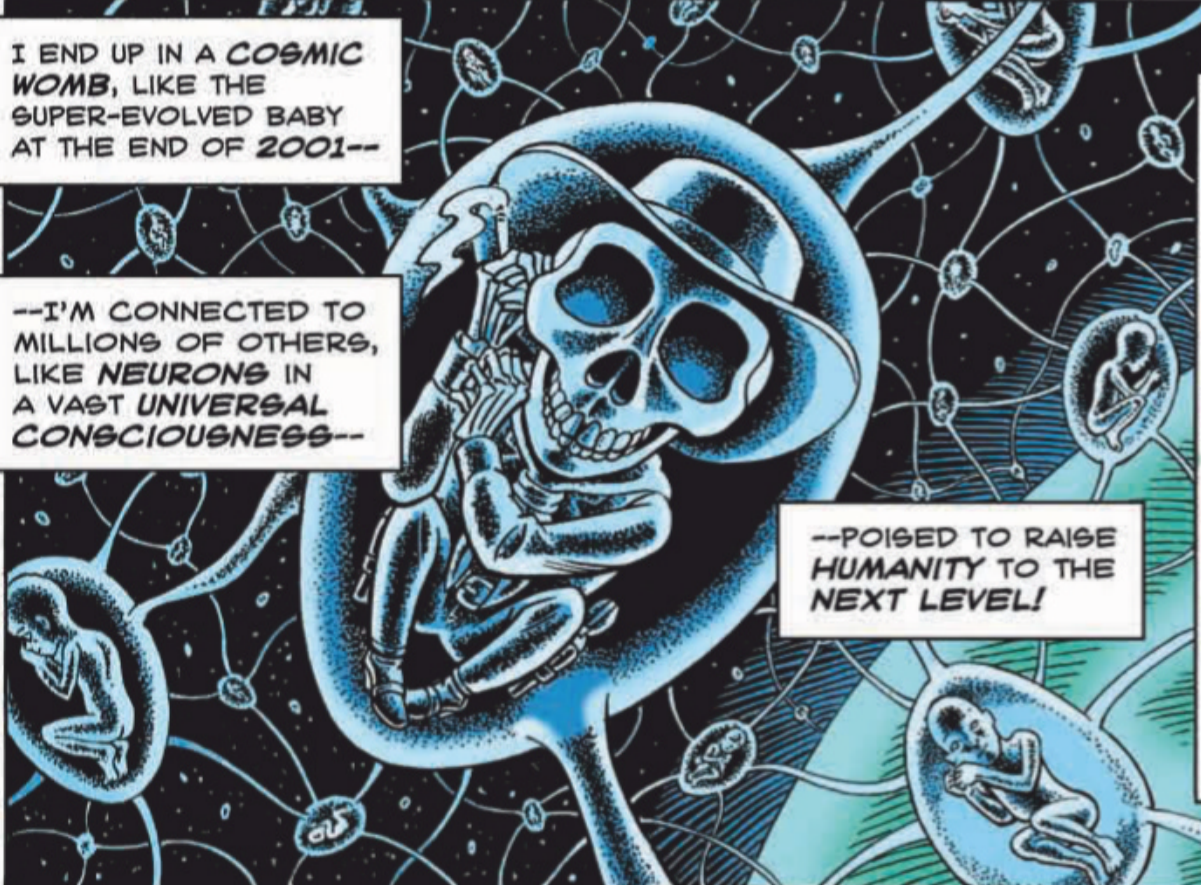
PAUL KIRCHNER



MY ECTOMPLASMIC BEING SHOOTS OUT OF IT AT THE SPEED OF ENLIGHTENMENT.



FOR WHAT SEEMS LIKE AN ETERNITY, I TRAVEL THROUGH DIMENSIONS OF FORM AND COLOR.



I END UP IN A COSMIC WOMB, LIKE THE SUPER-EVOLVED BABY AT THE END OF 2001--

--I'M CONNECTED TO MILLIONS OF OTHERS, LIKE NEURONS IN A VAST UNIVERSAL CONSCIOUSNESS--

--POISED TO RAISE HUMANITY TO THE NEXT LEVEL!

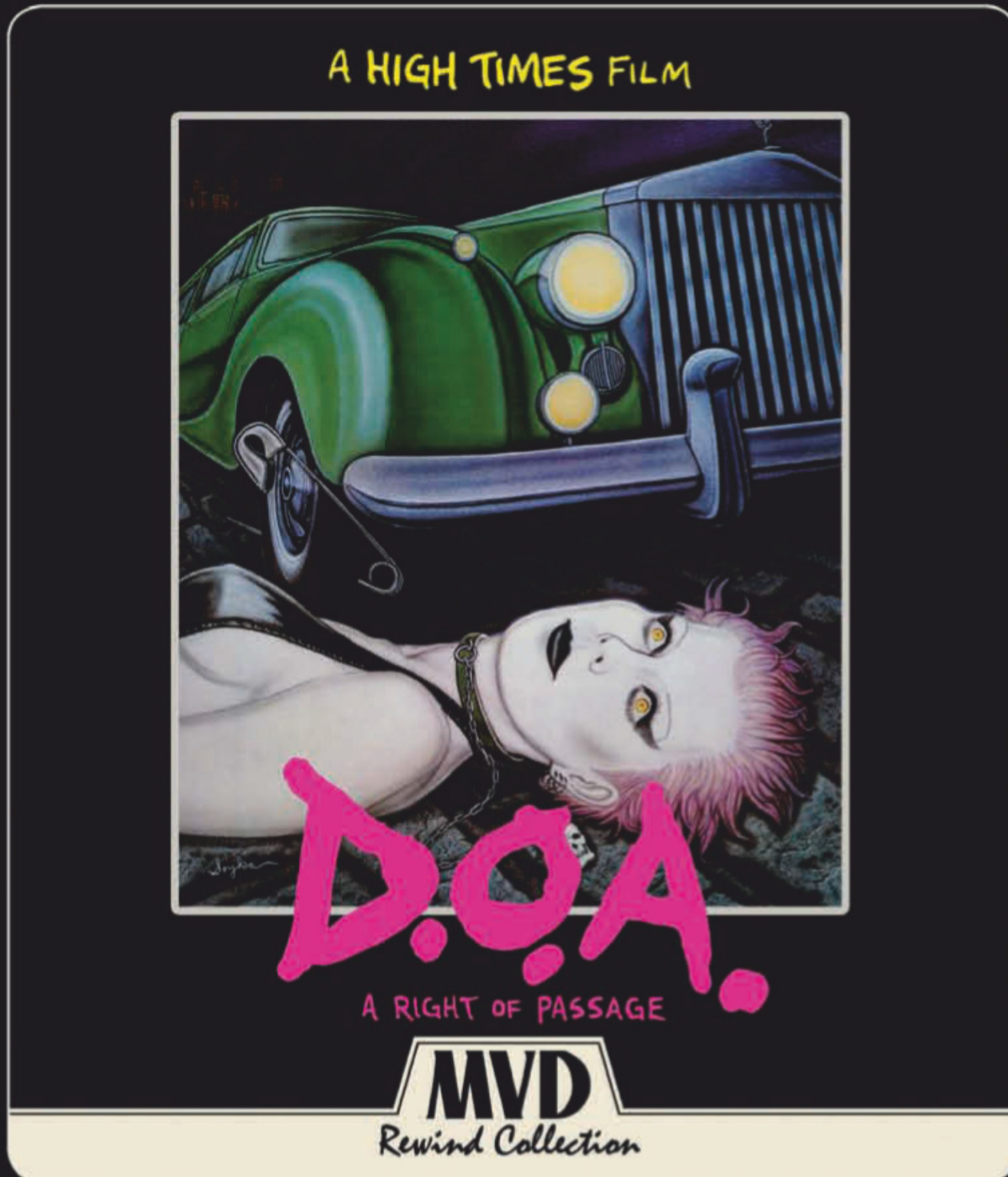


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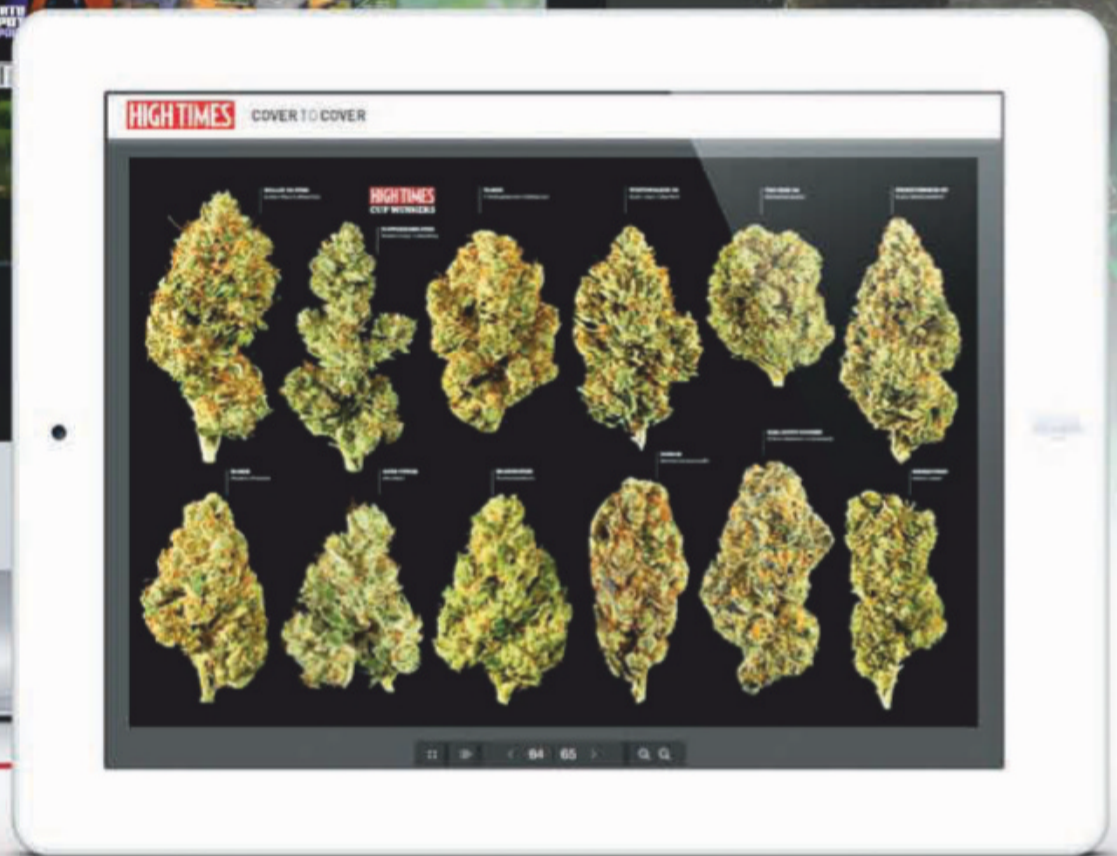
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