

Marijuana manufacturing 2.0

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Companies large and small are racing to bulk up on tech innovation for a nascent legal market that is suddenly, well, ablaze.

By Jane Porter



FORTUNE -- Matthew Cohen wants his startup **TRiQ** to be the Toyota of marijuana manufacturing. The company, which opened its doors in Ukiah, Cal. in 2013, has a long way to go. But already, TRiQ is partnering with software and manufacturing companies outside the cannabis industry in an attempt to revamp the way marijuana is being produced. "Toyota is one of our idols," Cohen says. "How they took car manufacturing systems and totally reinvented it -- that's similar to what we are trying to do for cannabis now."

Meanwhile, up north, just outside of Detroit, Sam Alawieh, CEO and founder of the pharmaceutical company RXNB, has developed closed-door climate bay technology to replicate the exact environment of 50 different strains of marijuana in a controlled and sterile manufacturing environment. Alawieh, whose background is in pharmacology, has 32 patents pending on marijuana-related technologies. "People have been focused on access," he says. "But the second-wave evolution is about predictability and accountability."

The legal marijuana market in the U.S. is expected to grow 64% in 2014 to \$2.34 billion, according to ArcView Group, a cannabis industry-focused investment group. In five years, ArcView estimates that figure will reach \$10.2 billion. Recognizing marijuana's growing market potential, companies big and small are scrambling to get ideas patented. But until the federal government -- which ironically **has its own health patent** on marijuana -- changes its classification from a **Schedule 1 drug**, many investors and businesses are loath to risk involvement in the market.

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Still, technology is exploding in the marijuana industry as a growing number of states move toward legalization, with innovations ranging from production equipment to vaporizers to products created with THC extracts. In the areas of manufacturing and software, there's a tremendous market to be tapped, says Justin Hartfield, CEO of **Weedmaps.com** and founder of the private equity group **Emerald Ocean Capital**, which focuses on the cannabis industry.

Realizing the need to streamline and improve the production process, companies are trying to figure out how to grow, harvest, and process marijuana in the most efficient, controlled, and effective way possible. TRiQ has a patent out on a technology to dry marijuana in a way that kills specific molds dangerous to immune-deficient patients. They've partnered with a software company that develops pharmaceutical management programs, a manufacturer making Near-Infrared

testing technology, and greenhouse engineers from Holland creating large-scale greenhouses that are entirely mechanized. "It's all part of our vision to get everything into a whole system design," says Cohen.

Much of the technology happening in the growth market involves LED lighting, which offers growers a more sustainable sophisticated lighting source to grow indoors. Among the technology Alawieh is working on are patents that look at how to enrich the growth cycle of specific strains at the cellular level, with the potential to create crops that bloom continuously, rather than seasonally, yielding more marijuana per plant.

Alawieh has licensed RXNB's technology to CEN Biotech, an offshoot of the publicly traded company Creative Edge Nutrition, based just outside of Detroit. The company broke ground on a \$12 million manufacturing facility in Ontario, Canada and plans to grow and sell 1.3 million pounds of medical marijuana this year in the Canadian market. "Everything will be completely computer-automated," says Bill Chaaban, CEO of Creative Edge Nutrition, which has made its bread and butter selling nutritional supplements and energy drinks in the U.S. "You're not going to have a guy walking around with a ponytail and jeans."

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For Chaaban breaking into the Canadian market was a viable alternative to the U.S., particularly as patient accessibility grows more lax in British Columbia. But while companies like Creative Edge Nutrition can't legally grow or sell medical marijuana in the U.S., that doesn't mean they aren't preparing for the law to change. CEN Biotech also has a subsidiary in Michigan, and Chaaban is scouting locations for a U.S. manufacturing facility. "We've set it up to have the infrastructure in place for when we do see a change in federal law, so that everything is [ready]," he says.

To date, medical marijuana use is allowed in 20 states and the District of Columbia. But while Colorado and Washington already having burgeoning retail industries, in nearly half the states where cannabis can legally be prescribed, there is no retail market -- not yet at least.

Businesses are acting cautiously. Technically, the federal government can raid and confiscate marijuana even in states where the drug has been legalized for medicinal purposes. Cohen knows this firsthand. Before founding TRiQ, he ran Northstone Organics Collective in Medocino County, Cal., which in compliance with state laws, grew marijuana that supplied the collective's 1,700 members until October 2011, when federal agents unexpectedly showed up with chainsaws and rifles, destroying and confiscating all 99 plants.

Cohen's newest undertaking lies not in growing, but in helping to address some of the challenges growers face -- from bottlenecks caused by inadequate drying methods to keeping marijuana fresh on the shelf year-round to preventing mold contamination -- using technology.

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Others in the industry have been working at putting an infrastructure in place to legitimize and systematize the industry. Rob Hunt, executive vice president and director of Growlife Inc., (PHOT) a publicly traded company in Carson, Cal. that makes and markets horticulture with a focus in cannabis, recently announced an initiative called the Gift Program, in which they will fund large-scale growth operations and technology. The company has bought a 25% stake in CEN Biotech and is also working on a distribution technology that would place kiosks into dispensaries in order to digitize and secure patient transactions.

But given marijuana's still relative newness to the legal marketplace and its federal black-market status, there's virtually no large-scale research being done on the actual physiological effects various strains of cannabis have on the body. "Picture going back a hundred years before we knew what we know about medicine now," Hunt says. "There's a lot of that still with cannabis. Most dispensary owners are really wishing they had better access to the analytical information associated with genetic mapping."

Still, progress is being made. "Watch what happens with technology in the next two to three years," Hunt says. "As legislation changes and as the marketplace becomes less restrictive, you will see smarter and smarter people enter the space."

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