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Cultivation



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FROM THE EDITOR



Jenel Stelton-Holtmeier
Marijuana Business Daily

There's more to growing marijuana than the actual cultivation process. The cannabis industry is complicated, but it can offer great rewards—if you build your business on a solid foundation.

That's where this report, "Cannabis 101: Cultivation," comes in.

The team at *Marijuana Business Daily* assembled this collection to help you create a business that will help you attain your goals.

Over the past few years, the industry has seen pretty much everything—from product shortages in newer markets such as Illinois to oversupply and bottoming prices in Oregon, from wildfire smoke destroying California crops to mold and other contaminants rendering products unsellable. In addition, general economic conditions have taken a toll on market strength.

But companies that started with a plan that included a strategy for dealing with standard business challenges on top of the unique cannabis requirements are the ones that survived the hard times and came out the other side even stronger.

This report will help you create that blueprint for your business. In this report, you'll get insights on, among other things,:

- Designing your operation for growth.
- Finding the right partners at the right times.
- How to assess market competition and identify opportunities.
- Evaluating systems for your growing goals.

While each business and each market will face distinct challenges, we hope this guide provides you with the tools to build that strong foundation for the long term.

As always, feel free to reach out if you have any questions or comments. We love to hear from you!

A handwritten signature in black ink, appearing to read 'Jenel Stelton-Holtmeier'.

Jenel Stelton-Holtmeier
Editorial Director



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- Use a conductivity or ppm meter to monitor water quality and control nutrient strength. Drain, discard and replace nutrient solution every week or less to prevent nutrient imbalances.
- Maintain nutrient pH between 5.5 and 6.5. Adjustments may be necessary since water quality and pH vary both regionally and seasonally.
- Refer to the Basic Applications Table for general mixing recommendations. Please measure accurately. Reduce nutrient strength if plants show signs of stress or if growing in very bright, hot or dry environments.

MIX WELL BEFORE USING: Always add FloraBloom to fresh water first and stir well, then add FloraGro and/or FloraMicro. Never combine FloraBloom with FloraGro or FloraMicro in undiluted form; doing so may cause nutrient lockout making some nutrients unavailable.

Plant	FloraBloom	FloraMicro	FloraGro
Flowering	1.0	0.5	0.4
Fruiting	1.0	0.5	0.4
Seed Production	1.0	0.5	0.4

Basic Applications Table

Contents and handling: General Purpose - Mild temperature. Application to water: 1.0 L (0.264 gal) per 1.0 L (0.264 gal) of water. Shipping and Packaging: 473 ml (1 PINT) 1.22 lbs (0.55 kg)

These values are intended to be used without adjustment. Please consult the label for more information.

Advanced

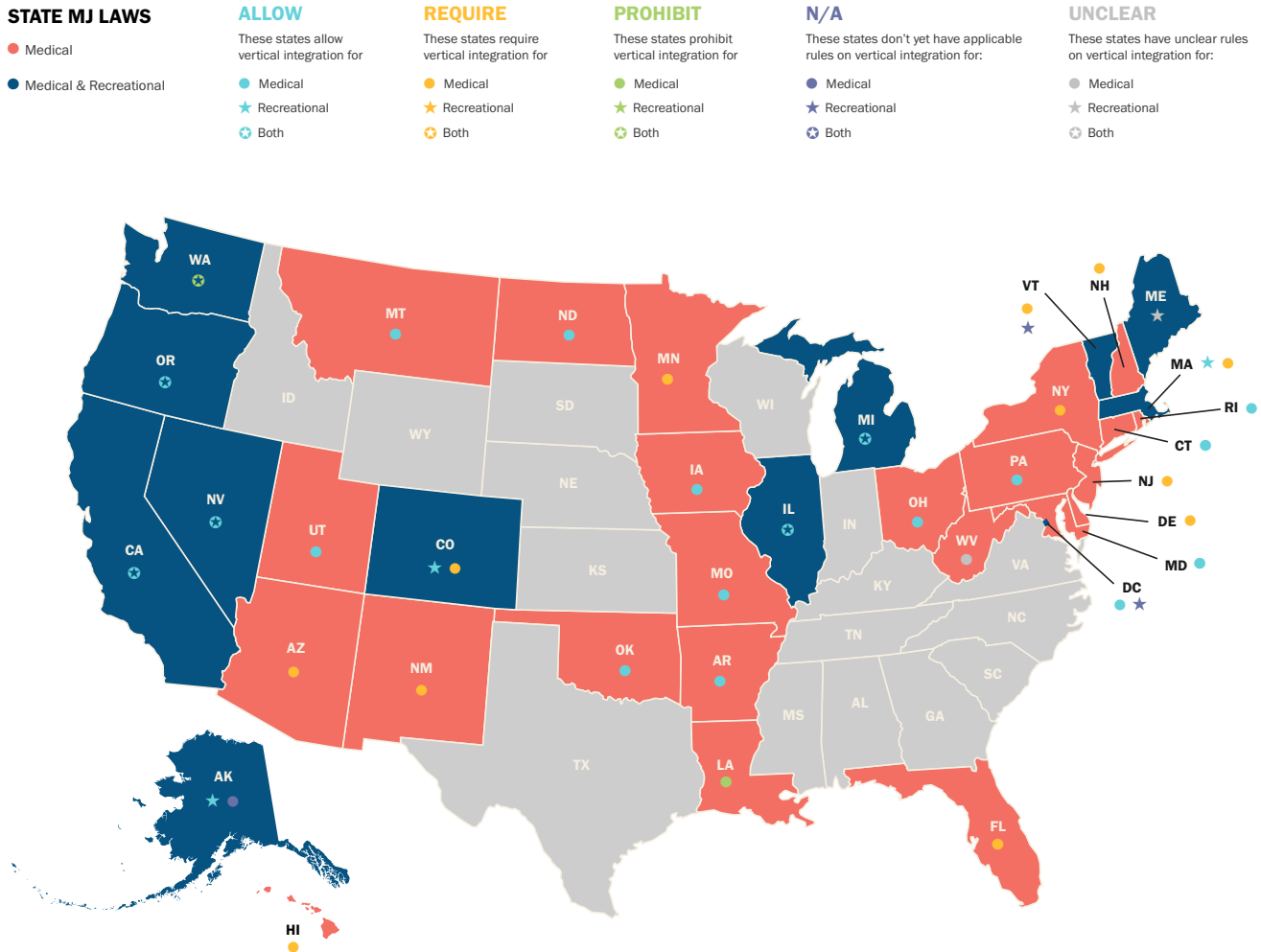
56.7 L (15 Gallons) 208 L (55 Gallons)

MATCHING YOUR GROW TO YOUR GOALS

So you want to grow cannabis. That decision is a great step. But before you launch into building a multimillion-dollar facility, there are a few other questions you should ask yourself. .

First, make sure you have a clear idea of your goals. Why do you want to grow cannabis, and what do you hope to get out of it? All your other decisions should be made with that in mind.

Here are some of the other decisions that will help shape your operation.



VERTICAL INTEGRATION

Vertical integration means that you're taking on at least one other level in the supply chain on top of cultivation, often retail. Growers will often operate a storefront to sell some of their product, ensuring an outlet.

But you'll also be taking on an operation that has a completely different business model that requires additional skills.

Business owners make the decision early on to vertically integrate, and in some markets, the state chooses for you. In Washington state's recreational market, vertical integration is prohibited, and in New Mexico's medical marijuana market, it's required. Other states, such as Colorado and Oregon, allow vertical integration but don't mandate it.

The industry itself is divided on the best path for success, with several pioneers saying they wished they had focused more on their specific areas of expertise. Others noted that you can still do that while hiring a team to help you strengthen the other areas.

Ultimately, the decision is up to you—and the market in which you plan to operate. But make the decision with your goal in mind.

SIZE MATTERS

Some markets, such as Oregon, have suffered from an oversupply of cannabis—the result, in part, of the state having no caps on the number of licenses allowed. So differentiating and finding a sales outlet for your product can be challenging.

But, if the industry evolves under the right conditions, advocates of small marijuana businesses say that craft will be the future of cannabis. Under the wrong conditions, they warn, craft will die, leaving the industry to a handful of large, multistate marijuana companies.

Craft's appeal to consumers is understandable—higher-quality products made by a local whose story enhances the experience. But it also costs significantly more to produce craft products, making it harder for smaller companies to stay in business.

Success with craft cannabis also requires a compelling message that resonates with retailers and consumers and the ability to relay it effectively through available channels, such as packaging, social media, alternative newspapers and the company's own salespeople.

DESIGNING A FACILITY FOR GROWTH

Designing and building a marijuana cultivation facility is no small undertaking. Like any other major project, it's rife with pitfalls. But you can plan and take steps beforehand that will help ensure your cultivation operation won't sink before it swims—and that it won't bankrupt you.

Here are some of the key considerations for ensuring your facility can grow with your plans.

LOCATION, LOCATION, LOCATION

Even if you're growing indoors, the general climate of where you're growing can have a huge impact on the efficiency of your operations.

If you pick a place to build that's in a climate with wide swings in humidity or temperature, you'll spend tens of thousands of dollars on equipment such as HVAC systems to keep those variables balanced and your plants in a comfortable environment.

Also be aware of zoning regulations and rules specific to cannabis. Because they don't rely on walk-in traffic, cultivation facilities often can be built in more remote locations, but doing so can present its own set of challenges.

INVESTING IN THE INFRASTRUCTURE

Growers in rural areas might not have adequate electricity from the power grid alone. Building the necessary infrastructure to power your grow can take years and hundreds of thousands of dollars.

Also, some rural plots of land don't have water rights.

On the other hand, in a more urban setting, you need to consider drainage. Cannabis growers can't have wastewater flowing back into the community's water supply.

A well-versed real estate agent—especially one who's dealt with cannabis businesses—should be able to assist.



Photo by Mark Blinch

DEVELOP A REALISTIC TIMELINE

One strategy to eliminate guesswork ahead of time is thoroughly planning your facility before breaking ground. A business plan will go through many iterations before you're ready to start building.

Issues will no doubt arise during the construction process. For example, state or local regulations could change while you're building your facility.

Any changes you make will affect your entire timeline. If you decide on different lights halfway through the building process, you might need to alter your electrical plan and, subsequently, your heating, air-conditioning and water plans.

A typical project can take anywhere from nine to 18 months to complete.

Your timeline should also consider your ultimate goals: How do you want to grow your business? Build that long-term strategy into your current plans.

BIOSECURITY

Outside contaminants such as pests or disease can enter your facility along with your employees. And once the wrong thing gets in, it can devastate your crops.

Protect your investments by providing a changing room for employees to keep their street clothes away from the plants. Some operators also recommend "quarantine entries" that have air curtains that blast air from above to create a physical barrier against insects and knock off any critters that might be hitching a ride on workers' clothes.

And don't forget to look down. Install floor mats so employees can clean their shoes as well.

Another consideration should be the materials you use within your facility. Wood absorbs moisture and humidity, which leads to mold. Flat surfaces collect dust and other contaminants.

DESIGN FOR THE WORK

Cannabis cultivation involves many repetitive tasks, so you can save time and money by designing your facility with workflow in mind. For example, building an intake area where you bring in clones from another nursery near the potting area is ideal because the pots will be heavy and grow media will travel a minimal distance.

But also make sure you have enough space for your current—and future—plans. Crowding plants into inefficient grow spaces will lead to you producing an inferior product and cut into your bottom line.

MONEY MATTERS

Chances are that unexpected costs will arise while you're setting up your operation. This could include not having adequate infrastructure to power your facility.

It's also common for a project to take much longer than the original timeline and schedule.

Make sure you have enough funding to complete the project—and that any financial partners are kept in the loop when things inevitably stray from the original plan.

It will take time for your facility to become profitable—sometimes as much as five years—so make sure you have access to operating reserves to get you through those first few lean years.



Photo by Mark Blinch

STARTING WITH THE RIGHT TEAM

Having the right people on your side beginning with the launch of your operation will give you an advantage when navigating the complicated landscape of legal cannabis.

Before you start building your team, however, decide on your own role in the company. Identify your strengths and weaknesses for operating a cultivation business and then surround yourself with people who can complement your skill set.

Key roles to consider at the outset include:

CULTIVATOR

The best candidate for your lead cultivator isn't someone who learned to grow marijuana in the backyard or basement. Someone with a strong background in cultivating other crops can apply that expertise and similar techniques to marijuana.

Your lead cultivator needs to be highly organized to keep everything on schedule. That person must monitor the plant inventory and maintain supplies to ensure, for example, that nutrient mix levels are perfectly balanced.

But be wary of growers who claim to be the best in the industry. While the industry is now old enough to boast some veterans, it's likely your best candidates will have some personal growing to do.

LEGAL ADVISER

When seeking outside or in-house legal representation, you want an attorney who doesn't think of cannabis law as a side gig. Marijuana rules and regulations change constantly and require specialization to understand.

Hiring specialized counsel helps you avoid attorneys who are in it only for the money. Many business owners are surprised when they are hit with unexpected issues that could have been anticipated, including zoning ordinances, restrictions on advertising and mandated tracking and handling of products.

It's important to keep in mind that many attorneys are skilled in marijuana law—they know the regulations and are adept at compliance and lobbying. But they might not be very good at the actual legal side of business needs. For example, an attorney well-versed in marijuana policy might not understand how to evaluate employment contracts.

Also be aware there might be times you need an attorney who is more focused on a specialized area such as intellectual property rather than cannabis alone. The best attorneys will tell you if a subject matter is outside their area of expertise.

ACCOUNTANT

Finding an accountant or bookkeeper you can rely on is one of the most important moves you can make in the cannabis industry. That person could save you a run-in with the IRS or state tax authorities.

In short, you want someone trustworthy, detail-oriented and up to speed on the intricacies of the cannabis industry—including special compliance needs and 280E, the infamous section of the federal tax code that blocks marijuana firms from taking the standard deductions that non-cannabis businesses are permitted to use.

SECURITY LEAD

Most of the legal cannabis frameworks established by states and localities include security requirements, so you want to have someone on your team who can ensure your compliance.

You want someone who pays attention to detail, has the ability to follow a process and offers a strong response to a more disciplined structure.

COMPLIANCE OFFICER

The recurring theme with any cannabis business is that there are many complex rules and regulations that must be complied with at all levels. Putting someone in charge of auditing your processes to ensure compliance with these rules will help centralize the responsibility and create consistency in enforcement.

This person will need to have high attention to detail while still being able to see the big picture within your operation. Monitoring track-and-trace tags, for example, shouldn't interfere with the actual act of growing.

DON'T GO IT ALONE: THE POWER OF PARTNERSHIPS

Finding the right partners is often critical to long-term success for any business, but the road to a fruitful and successful relationship is littered with potential potholes. And being a plant-touching cannabis company can compound the challenges.

BUSINESS PARTNERS

Value alignment is one of the most critical components for a successful business partnership. If there is a major difference in priorities, partners can clash or even wind up working out their differences in court.

Spend as much time as possible getting to know any potential partners. That means lengthy, in-depth discussions about what partners bring to the table, why they're interested in the cannabis business, if they're committed to running a legal and compliant operation and what their long-term goals are.

OUTSIDE FINANCIAL PARTNERS

Cannabis is an expensive business, as the complex regulatory environment often requires big investments to even get your operations approved. So it's critical to ensure the right financial partners are in place from the start so your plans aren't derailed before the train even leaves the station.

Many startup operations rely on family and friends for funding, but even those relationships must be approached with great care.

Be up front about your plans and goals with any financial backers—and be crystal clear about their roles in your company. Some investors might expect to have an advisory role because they've handed you a check.



Photo by Matthew Staver

SUPPLY-CHAIN PARTNERS

All cannabis companies in the supply chain—cultivators, product manufacturers, retailers and others—depend on other vendors to provide them with supplies, product inputs and retail brands. While your company might operate meticulously and maintain strict compliance, some vendors might not.

Your business will not operate in a bubble. Success in business also means building relationships with people and organizations outside your company.

Even before you plant the first seed or clone, you should be thinking about where the final product will end up—and how it will get there.

The coronavirus pandemic highlighted some significant weaknesses in the U.S. cannabis supply chain.

The pandemic caused factory shutdowns in China, a major source of packaging materials and other products relied upon by U.S. marijuana companies. Similar disruptions followed in Italy, India and scores of other countries.

Do you have a plan in place if some outside force keeps you from getting a critical piece of equipment? And on the other side, what if your product buyer becomes unreliable, where will your product go?

Building strong, professional relationships with your supply-chain associates—rather than just transactional connections—won't completely alleviate the fallout from unexpected disruptions, but it could result in a partner who is willing to help lift you back up. After all, their success is in many ways tied to yours.

REAL ESTATE

Zoning rules create complicated and vexing issues for those wanting to open a marijuana business in almost any U.S. market.

But the task of addressing zoning issues can be made easier if cannabis entrepreneurs work with city officials early in the process and enlist the aid of experts familiar with local rules and regulations, which can vary greatly from community to community, even in the same state.

Here are some key things to consider when looking for the right real estate:

BUFFER ZONES

Many legal markets require a buffer zone—a minimum distance between the marijuana operation and other types of facilities such as schools or day-care centers. Dealing with these issues can be time consuming and expensive.

And jurisdictions can be as strict as they want. For example, in Denver, the city rejected an application for a cannabis-related business because it was 980 feet from a child-care center instead of the required 1,000 feet.

ZONING

Zoning rules dictate what can be built on a given plot of land. For example, marijuana cultivation facilities are often restricted to industrial zones.

But zoning regulations can also dictate the size and shape of your operation, with rules that require certain types of security or mandate limits on energy consumption.

Marijuana businesses looking for real estate could benefit from enlisting a broker and looking at several listings. Opportunities can vary even within a geographical area because of differences in zoning regulations, taxes and economic incentives.

Hire a lawyer and/or a land planner familiar with local zoning rules to help you navigate the rules in the area you'd like to establish your facility—and make sure you get all the approvals before breaking ground. You don't want to invest \$1 million in a build-out only to find out you can't operate where you've built.

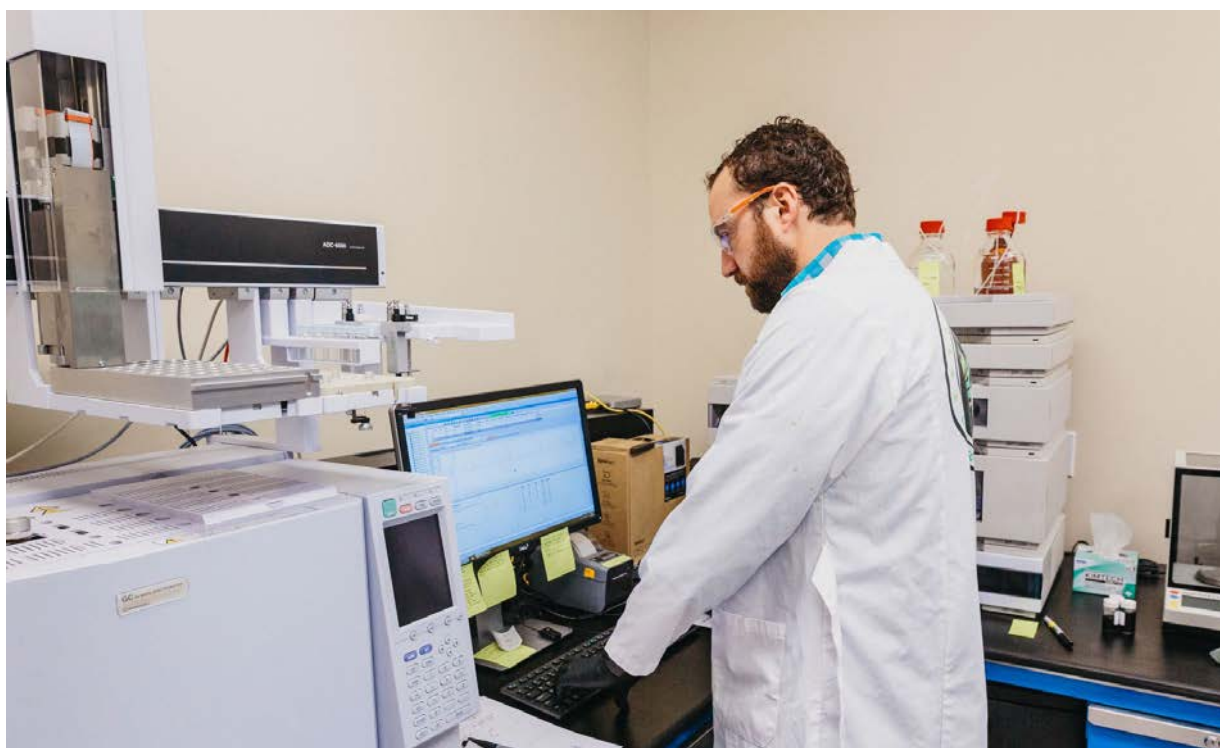
Also check with the city or county where you're planning to build, as it might have resources to keep you moving in the right direction. Just know that some cities are better equipped than others to address your cannabis business-related questions.

TO OWN OR NOT TO OWN

Owning the land and facility where you operate provides a level of control that you can't get from leasing. However, acquiring the real estate can be costly and lock up a significant amount of your seed capital.

Leasing space can be a costly ongoing expense, and businesses in the marijuana industry—thanks to the plant's federal illegality—often end up paying a premium for their facilities. But it is also a path to helping you better understand the zoning rules for your business.

The bottom line is that you want to be in the cannabis industry, not the real estate space, so balance the benefits and drawbacks for your company.



Courtesy Photo

TECHNOLOGY: ONE SIZE DOES NOT FIT ALL

Cannabis cultivators are turning to technology and automation to help achieve efficiencies, cut costs and keep workers safe during the coronavirus pandemic and the current economic downturn. But many of these adaptations will help even when times are good.

Here are some high-tech systems to consider for your grow operation:

BROAD AUTOMATION

The use of automation applies widely, from computer-controlled automatic irrigation and nutrient dispersal to machine trimming during the harvest cycle, and an array of companies has arisen to provide business solutions for cannabis growers.

For example, one company uses a sophisticated technology system to monitor, record and adjust the climate controls within its indoor grow room.

Automation brings a host of benefits, including cost savings on manual labor, more standard product results and the elimination of inefficiencies and financial waste as well as the compilation of data that growers can use to hone cultivation techniques.

But automation can also be expensive to implement, though costs vary immensely, depending on an operation's needs and how big a grow is.

Weigh the costs and benefits for your operation. It might benefit from some automation or you could decide that the timeline to return on investment is just too long. One size doesn't fit all.

ARTIFICIAL INTELLIGENCE

Even if you're not ready to hand over so much of your day-to-day decision-making to machines, implementing some level of artificial intelligence to help you process the vast amounts of data coming from your operation may be beneficial.

Indoor cannabis growers can use artificial intelligence (AI) to crunch key data to lower costs and fine-tune everything from irrigation and humidity to inventory management.

Recording data manually and trying to repeat it year after year, with varying conditions and sometimes different staff, creates an open-loop system that makes data subject to outside influences. AI helps close that loop to perfect recipes for crop production and improve consistency.

When growers have to track everything from compliance and traceability requirements to plant health and crop-management inputs, in addition to dealing with the weather and other variables, the pressure can be overwhelming.

Here are six areas where cannabis cultivators can benefit from AI-powered technology:

- Growing methods, or protocols
- Day-to-day labor savings
- Growth-rate tracking
- Yield forecasting
- Inventory management
- Profitability management

FUTURE TECHNOLOGY

Technology continues to advance at an exponential rate. And systems that are not quite where you want them to be—for example, automated trimmers—are constantly improving.

As your operation grows, consider revisiting the technology available to help you do so effectively and profitably.

And remember, your technology requirements will be different from another cultivators. Assess with your needs in mind.

EXPECT THE BEST, PREPARE FOR THE WORST

Predicting the next cannabis industry crisis and brooding over all the existential threats to your business can be wearisome and stressful, but it's an exercise that could help you be calm and ready when disaster strikes.

What are some possible threats to the cannabis industry that your business could get swept up in, and what are some dangers that could destroy your business specifically? How does one go about assessing the threats that might be out there?

CROP CONTAMINATION

To stave off contamination, successful cultivators practice a regimen of sanitation that includes scrubbing down rooms after plants have been removed and making workers wear protective clothing when in plant rooms.

Cultivators also have team members inspect the rows of plants for problems. If mold is found, for example, the grower should throw away all the plants in that room.

EQUIPMENT FAILURE

To avert equipment failures, growers should have backups for key pieces of equipment, particularly fans, air conditioners, dehumidifiers and lighting.

If a grower is using only one or two units large enough to cover a room, failure of a single unit could lead to the crop being destroyed by heat from lights. Deploying more smaller units means that if one goes out, others can still provide enough cooling to protect the plants—provided the units are distributed intelligently.

NATURAL DISASTERS

In the early days of the cannabis industry, insurance was largely an afterthought for many marijuana companies. But as the industry grows, insuring your assets is becoming a standard part of doing business—just as it is in every other mainstream sector.

Although many major mainstream insurance carriers won't work with cannabis companies, a growing number of brokers have emerged to help marijuana businesses find the coverage they need.

Each market will have unique factors that will affect your search for insurance, but for many growers—particularly those in natural disaster-prone areas—the time and money required might be a worthwhile investment.



Photo by Mark Blinch