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OUT OF THE SHADOWS

David Holmes once operated in secrecy to avoid legal landmines in California's murky regulated, pre-adult-use 'gray market.' After a 2013 raid derailed his business and threatened to destroy his family, he launched his Clade⁹ brand, and rebuilt his cannabis career and his life.

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5 Tips To Maintain a Healthy Organic Living Soil for Your Indoor Cannabis Facility

Organic living soil allows a plant to easily access which essential nutrients it needs when it needs them.

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If you scoop your fingers through layers of fresh, moist soil and look closely, you may notice the soil moves, crawls and even seems to breathe with life. There are more living organisms in a [teaspoon of healthy soil](#) than there are living people on Earth. Microbes, fungi, bacteria and insects are a few of the billions of hungry critters consuming and excreting their way through a living web of life within the soil.

This is why some indoor cannabis growers are embracing organic living soil methods. Organic living soil allows a plant to easily access which essential nutrients it needs when it needs them. The microorganisms exchange nutrients and microlife with the plants, creating a symbiosis in the soil that will continue perpetually. Growers mimic this natural balance indoors using a base soil and adding amendments and inoculants filled with fungi, bacteria, beneficial insects and other microlife. Healthy, balanced soil will make available all of the nutrients necessary for an eager, hungry hemp seed while keeping pests and disease at bay without the use of harsh pesticides or herbicides.

Take advantage of the below tips at your indoor growing facility so you can ensure your living soil will continue to give back to your cannabis plants day after day, week after week, and season after season.

Tip 1: Get a Base

The first step to maintaining a healthy living soil according to Chris Teeters, director of cultivation at [Harbor Farmz](#) in Michigan, is to have a good base. He's not just talking about base soil, but also a base of knowledge and experience about growing organically. Take some time to understand the systems of microbes that are responsible for keeping the soil alive and nutrient-dense for your plant, called the soil food web.

"Learn how to create a good base soil. Read about it, find a recipe that will work for you," Teeters said. Research is important, as living soil can be a scientific process. But learning through experience is just as important as reading up. "Don't get too wrapped up in, what I call, 'analysis paralysis,'" he said. "A lot of people will get stuck on what they're reading and what's going on in their head that they forget to just learn through application and observation."

Base Soil

Base soil is the foundation of your living soil. You can buy premixed recipes of living soil online, but Teeters recommends finding a local compost or soil business where you can see and touch the soil. They will also have a good understanding of soil mixes that will work well in your local environment. Most living soil recipes are a combination of peat, aeration (like pumice) and compost.

Consider using a cover crop or mulch (such as shredded hemp stalk and defoliated plant leaves) which will help retain moisture and capture excess nutrients in the soil.

Tip 2: Start With a Healthy Plant

A healthy soil that is mixed, fed and watered to perfection will mean very little if the plant you place into the soil is riddled with disease or a devastating stowaway pest.

Unless you are taking cuts or clones from your healthy plants, it's best to start from seed, said Jeremy Silva, owner of [BuildASoil](#), a custom organic soil and fertilizer company in Colorado. "There are problems you just can't see until you get more experienced. Even then, you're going to have some that slip through the radar, and you have to determine if it's worth it, and that should be based on experience," Silva said.

If you find that you have unwanted pests in your soil, predatory mites and other beneficial insects that reside in living soil can be helpful. Teeters recommends using heavily fermented plant extracts like comfrey and pumpkin, or diatomaceous earth, a pesticide made from fossilized remains of tiny, aquatic organisms, to help with pest problems. If pest pressure is high, a root drench using Karanja cake can be used.

Tip 3: Balance and Feed the Soil With Amendments and Inoculants

Just like in nature, your living soil will need a balance of macro and micronutrients to keep the plant thriving throughout its life cycle. Maintaining this balance in your living soil is largely determined by two things: amendments and inoculants.

Soil amendments are the compost, manure or mulch that enhance the soil's physical properties such as pH or texture. Inoculants are materials used to increase the level of microbes in your soil. Inoculants like fungi and bacteria promote root growth and break down the amendments, which in turn, feeds the plants.

When to Amend

How often you amend your soil will depend on the environment you are growing in. Teeters oversees a large-scale operation at Harbor Farmz that creates the optimal environmental conditions for its plants, so he and his team amends every 10 days. "Every room is under a parameter control system. I'm running these plants at the highest temperatures and highest humidity levels possible ... that they can handle during certain periods of their growth cycle to maximize growth," Teeters said. "The soil does require amending and put in a faster regime than a home grow because of the science behind what we're doing here."

For home growers growing with varying temperature and humidity, Teeters recommends amending at the one-month mark after planting and once more before harvest.

Pro tip: Validate your amendments if possible, especially if you are buying them online. You'll want to review the Certificate of Analysis (CoA) to make sure you are OK with the level of heavy metals or potential of pesticides, which can affect the quality of your cannabis.

Tea Time: Applying Amendments and Inoculants With Compost Teas and Seed Sprout Teas

Compost teas and seed sprout teas are both ways to apply amendments and inoculants that contain important fungi and bacteria to reamend the plants throughout their growth.

To create a compost tea, Teeters uses a large water reservoir fitted with a pump. He then adds worm castings, kale, alfalfa meal, feather meal, bone meal, nettles, comfrey and other organic amendments that contain calcium, magnesium, boron, nitrogen, phosphorus and potassium—all the macro and micronutrients necessary to grow plants. The water is agitated, oxygen is added and once the tea is brewed, it is mixed into the organic living soil. "We utilize those teas because they are living. We brew them to a

point where they're full of oxygen and microbes and bacteria," Teeters said. "So we utilize those compost teas to maintain a balance of life and nutrition in the soil."

Sprout teas are created by soaking seeds, such as hemp or barley grass, in a container of water until they germinate. The seed-and-water mixture is blended into a concentrate which can be added to your water then dispersed to your plants during watering.

Tip 4: Create a Watering Routine

[Watering your plants](#) is 20% of the process of maintaining living soil which can cause 80% of the issues if not done properly. BuildASoil recommends a watering formula of 5%-10% of the soil volume. If you have a small container with large plants, you'll need to water daily. If you have a larger raised bed with smaller plants, you'll only need to water about once a week. The temperature and humidity in your environment will also play a large role in watering your plants. "Think of soil moisture on a scale of 1-10. One being bone dry and 10 being muddy wet. We want to operate in the 3-7 range all day long, day in and day out," recommends BuildASoil's blog, "You can do this by calibrating automatic watering systems or by hand watering with a little intelligent thought."

Tip 5: Set it and Forget it

Once you've created a balanced web of life in your soil, resist the urge to till or disturb it. The whole goal of living soil, according to Teeters, is to get your soil balanced so that you can "set it and forget it."

"You want your soil to be settled in. That allows for the soil food web to start to generate itself and keep a balance and take off," Teeters said. "There's so many little microbes, bacteria, enzymes and fungi in the soil. By putting your hand in and mixing it up, you actually are destroying and disturbing that sensitive balance, even in the top layers of your soil."

Apply and Observe

The food web you create in your living soil may do better with certain amendments, something growers have to learn through experience. "It's OK to just try something, it's OK to put some extra alfalfa meal in one of your batches or don't put any alfalfa meal in a batch and use kale instead, and then add an additional amount of castings to your initial soil," Teeters said. "You're going to learn through practicality. You're going to learn the most through application and observation when it comes to the actual gardening."

Using organic living soil in your indoor cannabis growing facility is a sustainable, low-waste growing method, as well as a beautiful example of how scientific application and Mother Nature can work together. This balance creates a mutually beneficial web of life that can create smooth, high-quality cannabis that some growers, like Teeters, believe is a difference you can taste.

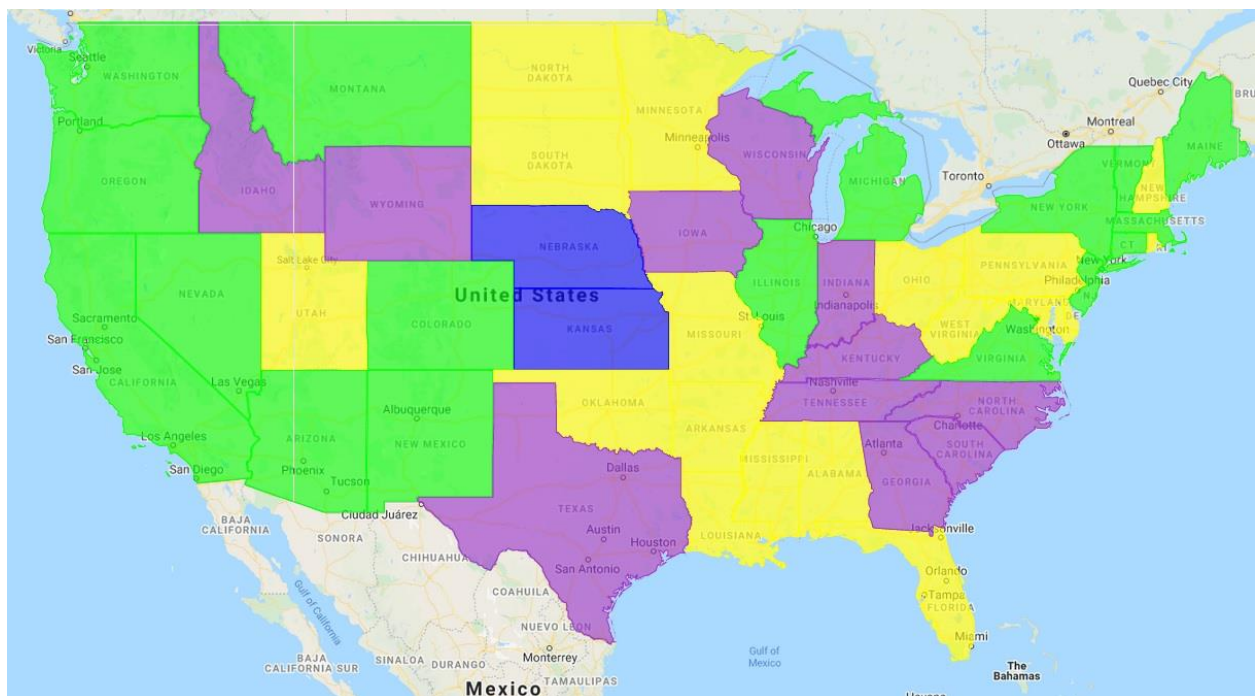
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