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BEGINNER'S GUIDE TO INDOOR CANNABIS GROWING

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Introduction

This guide will show new cannabis growers the basic steps to grow and care for cannabis from seed to finished product!

Every cannabis strain will vary slightly in growth times and feeding needs, this guide will work for most photoperiod or autoflowering strains.

Most information in this guide will also work for outdoor grows, with some modification!

See back of booklet For **Glossary, Troubleshooting, FAQ, and Advanced Care.**

What you will need

Seeds:
Cannabis seeds are sold in all minnesota-based highnorth stores.

Soil:
Organic is recommended for the best outcome.

Water:
Must be chlorine-free, distilled works best.

Nutrients:
Optional, but helpful.

pH Testing Strips:
For testing soil acidity.

5 Gallon Pot:
For planting.

Grow Tent/Grow Room:
Controlled space to optimize your grow.

Lights:
100 watts or higher.

Oscillating Fans:
You need at least one.

Mason Jars:
Used for curing your harvest.

Humidity Packs:
optional, helpful for curing.

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Autoflower vs Photoperiod

Most beginners are pushed towards **autoflowering cannabis seeds** because of their "ease of growth." However, autoflowers are very picky with their environments and can be a headache if conditions aren't perfect. While autoflowers *do* have the benefit of fast growth with fast flowering, they *do not* allow for cloning, and *do not* respond well to low stress training (LST), meaning lower yields and only one harvest per seed.

Photoperiod cannabis seeds are the most commonly used seeds for commercial and personal grows. Photoperiod seeds allow for much more forgiveness when low stress training, trimming, topping and cutting clones. Photoperiod plants will require more attention to detail and more hands-on work with the plants, but they allow for multiple harvests, low stress training, and breeding.

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Seed Propagation

Cannabis seeds will propagate like any other seed!

First step is to take the seeds and spread them out on a moist paper towel and fold the towel over the seeds.

Second step is to mist the towel with water so that it's moist, before placing it into a plastic bag to trap humdity.

At this point, you will simply wait until the taproot pokes out of the seed. Once the taproot emerges, transfer the seed into your grow medium or soil. Keeping the seeds warm is important so don't leave them in a cold place for too long. **The germinating seeds are best kept around 65-75 degrees Fahrenheit.**

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Vegetative Stage

Once the seedling has established itself in the soil or grow medium and produced it's first fingered leaves it has entered the **vegetative stage.**

The vegetative stage is where the plant will exhibit the most growth, both vertically and horizontally. This is the time to introduce **low stress training** to the plant. The plant will respond well at this stage, growing how you shape it.

Watering in this stage will be more intensive as the plant grows to it's final size. Watering every 2 days will give the plants enough time to absorb the water without developing root rot. Water the top layer until wet, but not holding standing water. For most plants the **vegetative stage will last anywhere from 3-16 weeks.**

If you experience flowering signs early, there may be a major cause of stress for the plants. Temperature and humidity play a huge role in plant health and growth at this stage. Although optional, many growers choose to add nutrients at this stage to accelerate growth. Though be wary to not over-feed the plant.

Light Cycle: 18 hrs of light, 6 hrs dark. Keep light 12-16 inches from top of plant at this phase.

Temperature: between 70-80 degrees fahrenheit

Humidity: Between 40-60% relative humidity

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Flowering Stage

The flowering stage is the most important and the most fun!

In order to force the plants to flower the light cycle has to go through a major shift to stress the plants into flowering. This is where another key difference between Autoflowering and Photoperiod plants comes into play.

Autoflower plants do **not** need to switch light cycles to flower.

Photoperiod plants will need seasonal change to be simulated with the lights.

Light Cycle: 12 hrs of light, 12 hrs dark for photoperiod seeds. Autoflowers can remain on same light cycle. Keep light 12-16 inches from top of plant.

Temperature: Between 65-80 degrees fahrenheit

Humidity: Between 30-50% relative humidity

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Flowering Stage

In this stage humidity and temperature will be lowered. This will help prevent mildew from forming on the leaves, and bud rot from forming in the flowers. Flowering typically lasts between **7-9 weeks.** There will be steady bud growth throughout the flowering stage until the last few weeks when the flowers will swell in size and weight.

As the buds begin to reach maturity the leaves will start to fade. This is because the plant draws nutrients from the leaves to finish the bud growth. You will also see the trichomes start to turn milky and amber, signaling the plant is close to harvest. At the end of the growing cycle the plant will be ready to harvest!

Light Cycle: 12 hrs of light, 12 hrs dark for photoperiod seeds. Autoflowers can remain on same light cycle. Keep light 12-16 inches from top of plant.

Temperature: Between 65-80 degrees.fahrenheit

Humidity: Between 30-50% relative humidity

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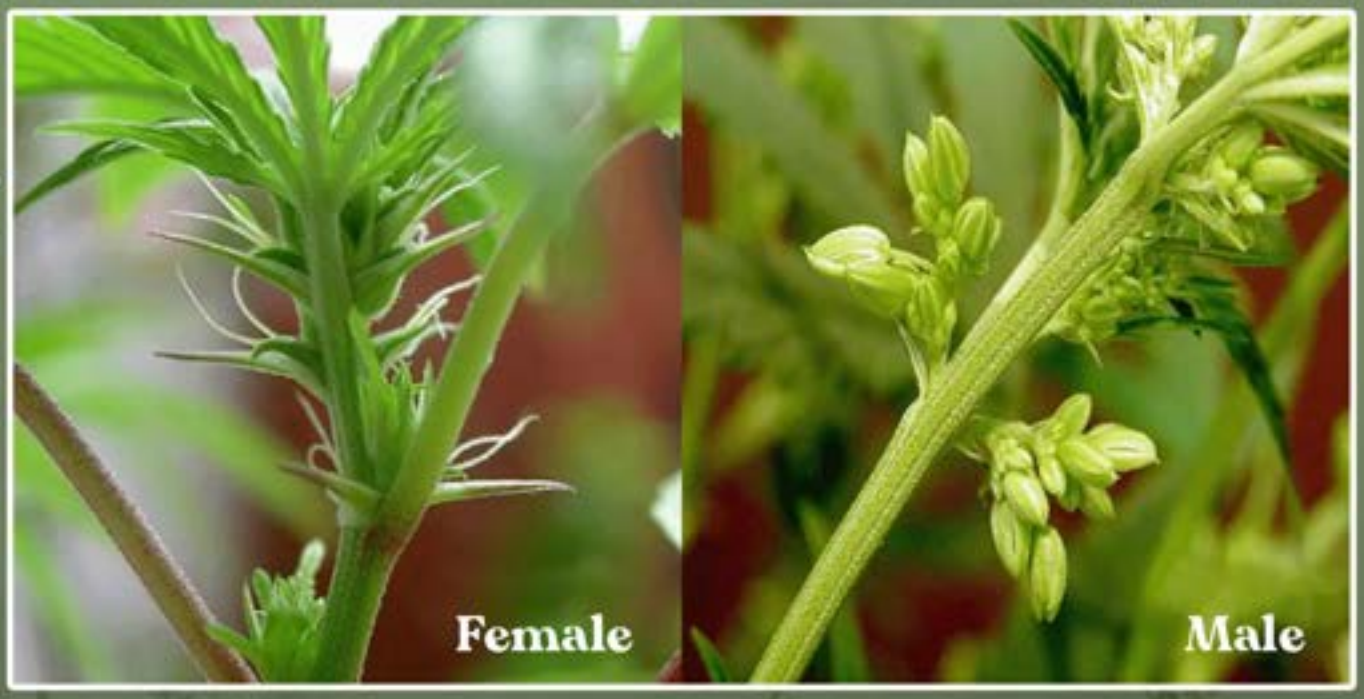

Male VS Female Plants

During the early stages of flowering the first signs of the plant's sex will appear.
On a female plant there will be 2 calyxes with a few hairs (pistils)
in the node, or where the branches come off the main stem.

Female plants will look very similar to the male plant except for male plants will
not have the hairs coming out of the calyx and the pollen sack will grow instead.

The best practice is to cut down any male plants you find **immediately**!
Male plants are able to pollinate all the other plants in the grow and ruin the harvest.
That means a complete restart.

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Harvesting

Harvesting cannabis can be a very tedious job. Whether you chose photoperiod or autoflower plants, you need to cut the plant at the base and separate the branches from the main stem. After a little clean up of dead leaves and smaller branches it's time to get ready to dry.

Photoperiod plants are able to regrow for a second, and potentially third harvest! In order to do this you will need to leave smaller branches attached to the trimmed stump. Next, you will enrich the soil with "re-vegging" compounds, or nutrients.

If done correctly, the plant will begin to re-grow from the original plant stump, and you can get another harvest.

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Drying

Drying is a very important part of the process. While drying it is key to keep the flowers in a darker area with good airflow. Many growers will simply hang the whole plant upside down, inside of their tent or grow room after the harvest is complete.

Timeline: 7-14 days, or until small branches snap cleanly apart

Temperature: Between 60-65 degrees fahrenheit

Humidity: 60% relative humidity

Once the plant is fully dried it's time to trim.

Carefully remove the fan leaves and sugar leaves from your dry bud to prepare it for curing. Improper drying can lead to mold, so be sure not to trim too early.

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Curing

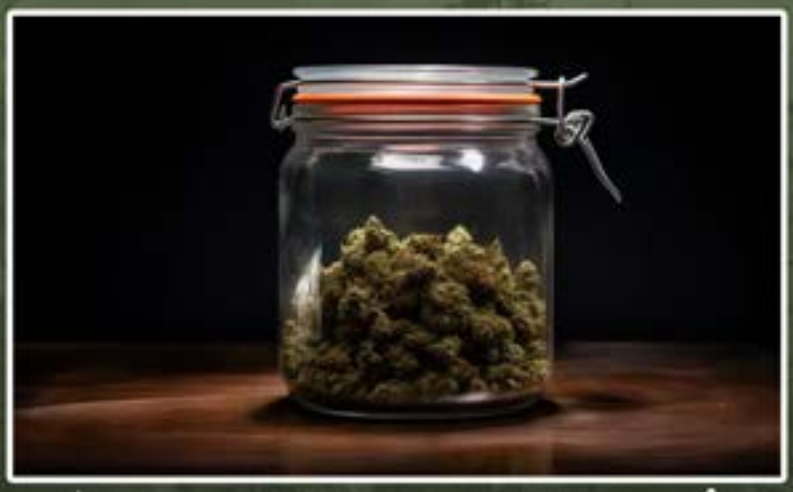
This is the final step before you get to enjoy your very own homegrown cannabis! All that is needed now is to cut the cannabis buds from the stems and place them into airtight jars, like mason jars. Fill each jar up to 75% full with buds and screw the lid on. Adding humidity packs into the jars can help stabilize the moisture in the jars. Once all the buds are jarred, place them into a dark closet or cabinet for 3-4 weeks.

For the first week of your cure you should open the jars 2 times per day, letting sit open for 5 minutes. This is called "burping", and it allows unwanted gasses to escape the jars. After the first week, you can burp the jars 1 time per day for the remainder of your curing time.

Timeline: 2-4 weeks

Temperature: Between 60-65 degrees fahrenheit

Humidity: 58-60% relative humidity



After the cure is finished it's time to roll up and enjoy your hard work and patience!

Thank you for using the Highnorth Beginners Guide to Indoor Cannabis Growing!

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Glossary

LET'S DEFINE SOME TERMS AND CONCEPTS FOUND IN THIS GUIDE

THC:
Tetrahydrocannabinol or THC is a crystalline compound that is the main active ingredient of cannabis. It's what makes you "high".

CBD:
Cannabidiol or CBD is A phytocannabinoid derived from Cannabis species, which is devoid of psychoactive activity, with analgesic, anti-inflammatory, antineoplastic and chemopreventive activities.

Calyx:
Function as protection for the flower in bud, and often as support for the petals when in bloom.

Clones/Cloning:
Plants that are able to propagate by asexual means to produce genetically identical plants.

Colas:
where clusters of buds grow tightly packed together. Typically, small colas may grow along with lower branches' budding sites, but the plant will have a "main cola" formed at the top.

Fingered Leaves:
long, thin leaves that grow beside one another, like fingers on a hand.

Grow Medium:
most commonly soil - a substance through which roots grow and extract water and nutrients. More about this in the FAQ section.

Low Stress Training (LST):
bending the plants branches to control height, shape, and light exposure. More on this technique in the FAQ section.

Pistils:
female organs of a flower.

Prune/Pruning:
cutting away dead or overgrown branches or stems, especially to increase fruitfulness and growth.

Glossary, continued

LET'S DEFINE SOME TERMS AND CONCEPTS FOUND IN THIS GUIDE

Stigma:
the part of a pistil that receives the pollen during pollination.

Taproot:
a large, central, and dominant root from which other roots sprout laterally. Typically a taproot is somewhat straight and very thick, is tapering in shape, and grows directly downward.

Trichomes:
A filamentous outgrowth or an epidermal hair structure on a plant.

FAQ

ADDITIONAL INFORMATION ABOUT CONCEPTS IN THIS GUIDE

Indoor VS Outdoor Growing:

If you're seeking to produce high-potency THC cannabis for personal use, then a fully enclosed indoor-grow is likely ideal.
For larger yields, like commercial grows, an outdoor or greenhouse grow might be more ideal. Cannabis plants will grow to fit their environment!

What are my options for growing medium?

Soil/Compost: the simplest and traditional way to grow your plants, this method delivers high-quality and high-taste end products. It may not deliver the highest yields but a more natural terpene-rich high.

Coco/Perlite: A mix of coco and perlite delivers the benefits of a hydroponic grow with the ease of a soil grow. But you will have to closely watch your pH levels because it's less forgiving of mistakes than soil.

Rockwool: an inert rock material that appears similar to wool. It's made from basalt rock and has excellent water-retention abilities.

Hydroponics: plants grow in a small amount of rockwool with roots reaching down into a liquid solution of water and nutrients.

Low Stress Training (LST):

Low-stress training means gently bending and tying the branches on your plant to control its height and shape. The main goal is to create a more even canopy, which will allow light to reach to lower branches and stimulate growth across all the entire plant. Low-stress training is known to increase the plant's exposure to light without causing stress that could hinder its growth.

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FAQ, continued

ADDITIONAL INFORMATION ABOUT CONCEPTS IN THIS GUIDE

What is THE SCREEN OF GREEN (SCROG)?

Placing a screen or net over the pot plants, then weaving the plant's branches through the screen as they grow. This method is used to evenly spread the branches across a horizontal plane, which leads to more optimal light exposure and encourages more uniform growth. Effective in maximizing yield when growing in a limited space, making it an ideal choice for those growing their cannabis indoors.

What is "Topping" and "Fimming"?

Pruning techniques employed during the early vegetative stage to encourage horizontal growth and maximize light exposure to the lower branches. Wait 2-4 weeks between cuts.

Topping: This method involves cutting off the top of the main stem, encouraging the growth of 2 main stems, rather than just one.

Fimming: This method involves pinching or cutting less off the top of the main stem for the goal of having multiple main stems.

Will cold weather ruin my THC levels?

Surprisingly, unlike most cultivated plants, hemp and cannabis withstand mild frost quite well. A study at the University of Vermont in 2018 tracked the difference in temperatures and resulting CBD levels of hemp plants. They discovered that though uncovered hemp plants experienced below-freezing temperatures several times throughout the study, the overall CBD concentration was unaffected. They also found that frost and cold weather can cause the plants to change color, but this has little to no impact on CBD or THC levels (Darby, 2019). Many purple strains are "cold shocked" to give them that unique coloring!

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FAQ, continued

ADDITIONAL INFORMATION ABOUT CONCEPTS IN THIS GUIDE

What is the best pH range?

Cannabis flourishes with a soil/water pH level between 6.0 - 7.0

When should I harvest?

The best way to tell if your cannabis or hemp plants are ready to harvest (both indoors and outdoors grows), is to inspect their stigma, the hair-like strands that cover buds. These hairs will turn from white to orange and begin to curl. Additionally, the trichomes (the resinous glands) will turn from clear to opaque, then amber in color. Waiting to harvest until approximately 75% of trichomes have turned milky is ideal to ensure a higher concentration of CBD and THC.

As more trichomes turn amber the THC will begin to convert to other minor cannabinoids such as CBN and CBD.

Seeds or clones - which is best?

Clones are produced by taking a cutting from a mother plant and allowing it to grow roots resulting in genetically identical, all-female plants with vigor and predictable traits. In comparison, feminized seeds may be less expensive than clones but have a greater chance of producing male and/or hermaphroditic plants. This means that hemp grown from feminized seed needs careful inspection to remove any male plants, increasing the cost of labor and production.

Both feminized seed and female clones have advantages and disadvantages that should be considered before investing in either.

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Advanced Care

Nutrients for cannabis plants

The main nutrients it needs are:

Nitrogen:
Helps a cannabis plant grow during the vegetative phase, putting on mass, stems, branches, and leaves. It is part of chlorophyll, so it helps a plant capture sunlight for photosynthesis, and helps make leaves green.

Phosphorus:
Essential for storing and using energy, as well as root growth and the development of buds. It helps a plant uptake nutrients to build its structure.

Potassium:
Helps with many of a cannabis plant's metabolic activities to keep it healthy, growing, and to help it fight off disease.

Calcium:
A minor nutrient, calcium helps a plant keep its cell walls together, and helps with the absorption of other nutrients.

Magnesium:
Magnesium is in chlorophyll, and helps plants create glucose from photosynthesis. Without it, the plant can't convert sunlight into energy.

Silica:
Can be used in soil to help strengthen stems, it acts as an alkaline adjustor and can be easily administered through a high-silica fertilizer.

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Advanced Care

DEFICIENCIES OF NUTRIENT ELEMENTS

Symptoms	Suspected Element										
	N	P	K	Mg	Fe	Cu	Zn	B	Mo	Mn	OF
Yellowing of Younger Leaves					✓					✓	
Yellowing of Middle Leaves									✓		
Yellowing of Older Leaves	✓		✓	✓			✓				
Yellowing Between Veins				✓						✓	
Old Leaves Drop	✓										
Leaves Curl Over				✓							
Leaves Curl Under			✓			✓					✓
Younger Leaf Tips Burn								✓			
Older Leaf Tips Burn	✓						✓				
Young Leaves Wrinkle/Curl			✓				✓	✓	✓		
Necrosis			✓	✓	✓		✓			✓	
Leaf Growth Stunted	✓	✓									
Dark Green/Purple Leaf & Stems		✓									
Pale Green Leaf Color	✓								✓		
Molting							✓				
Spindly	✓										
Soft Stems	✓		✓								

BIG PICTURE AGRICULTURE, 2015

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Advanced Care

Dealing with pests:

- Remove any infected plant from the grow environment to prevent contamination and spreading.

- Proper watering will help remove excess moisture in the soil where bugs will lay eggs and spread.

- Natural methods are best to preserve your cannabis plant's health and quality. For most bugs, products with *Neem Oil* work to repel and kill them.

- Diatomaceous earth works well as a top dressing on the soil to help remove crawling bugs.

- Sticky traps and UV zappers work for larger flying bugs.

- Constant moving air over the soil helps prevent eggs from being laid.

- Reducing temperatures can prevent reproduction in bugs.

- Hydrogen peroxide wipes on the plant will help kill insects and remove eggs.

- Spraying the plant with water to wash off bugs can help but will also wash off some trichomes with cannabinoids.

- A last ditch effort would be to wash the plant with insecticidal soaps to remove the pests.

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Advanced Care

Dealing with mold and fungus:

- Installing a grow room air filtration system can help reduce or eliminate airborne spores and fungi.

- Keep the air moving. Circulating air prevents moist air from stagnating in a corner of a tent and growing mold.

- Clean any wounds on plants with hydrogen peroxide to kill any spores or fungus in the wound.

- Remove any infected plant from the grow environment to prevent contamination and spreading. Using Propolis or bee glue will help remove fungus/mold.

- Trichoderma Harzianum added to the soil will prevent and kill fungus in the soil.

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Troubleshooting

COMMON ISSUES WHEN GROWING CANNABIS

Overwatering your plants:

New growers are often guilty of giving their cannabis plants *too* much love. This can manifest in overwatering. Overwatering your plant will lead to root rot and other diseases. The drying out of soil is important, it's how roots pull oxygen out of soil and into the plant. Watering and root problems can cause a variety of other symptoms including yellowing, nutrient deficiencies, leaf spots, brown edges, curling, and more.

Water only if the top 1-2 inches of the soil is dry!

Nutrient Burn:

It is easy to mistakenly overload your plants with nutrients. Many growers will think "more nutrients = bigger plant" and unfortunately that is not the case. Adding too many nutrients can cause many problems with the plant. It is much better to use slightly less than what the instructions call for. It is easy to add more nutrients, but correcting nutrient burn is much more challenging. Often manifesting as browning leaf tips that curl upwards, Cannabis nutrient problems are often closely related to the pH at the roots of your plants. That's because when the root pH is off, it can cause your plant to show signs of a nutrient deficiency, even if the nutrients are actually there in the soil.

Light Burn:

Keeping your plant a proper distance from the light will reduce or eliminate light burn. The early stages of light burn will have the top leaves pointing straight up at the light. Later, the leaves will start paling in color, slowly turning yellow then to a brittle dry brown. Often, Light burn is mistaken with nitrogen deficiency because they share many symptoms.

An easy way to mitigate light burn is to raise the lights away from the plant. If that is not possible, you can gently bend the plant away from the light and tie it down to create distance. This is a sort of Low Stress Training that should not affect the plant negatively.

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Troubleshooting

COMMON ISSUES WHEN GROWING CANNABIS

Wind Burn:

Keeping the plants away from the fans will help reduce or eliminate wind burn. By placing the plants too close to a wind source will casuse the plant to wilt and the leaves will turn into claw shapes closer to the fan.

The best practice is to have the fans blow along the walls of the tent to circulate the air without directing the wind at the plants.
The branches should *shiver* - not shake!

General Maintenance:

Identify and remove yellowing or dead leaves, as well as weak and withering branches. If plants are flowering, look for bud rot and mold. Inspect under the leaves, and where the stalk protrudes from the soil for various bugs, like spider mites and root aphids, that can disrupt your grow.

Cannabis plant leaves should be a dark, vibrant green. Yellowing, discoloration, or spots on leaves are another big giveaway that your plant is sickly.

Temperature and Humidity:

Hot temperatures will heat stress the plant causing wilting and brown spots, with some leaves drying up completely.

High humidity can cause mold and fungus to build up in various areas on the plant, more on dealing with mold and fungus in the **Advanced Care** section of this guide.

Cycling fresh air into the tent helps keep the plant healthy. moving air brings in more CO_2 for the plant to breath while removing the stale warm air in the grow space.

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Troubleshooting

COMMON ISSUES WHEN GROWING CANNABIS

Give your plant more light:

Many new growers don't realize they're not giving their plants enough light. As a very general rule, you want at least 100W worth of electricity going into your indoor grow light to harvest a few ounces. More is often better.

If your plants are growing very slowly, not drinking much water, or just aren't doing well, the problem is the likely needing more light to thrive. Try a more powerful source, or adding additional sources.

As stated earlier, too much light can cause more issues with temperature, humidity, and light burn, so don't overdo it, either!

Resource for cannabis plant diagnoses:

Scan for an interactive diagnostic tool that can help you to identify, and remedy most cannabis plant ailments.

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