

Forward

The topic of Marijuana cultivation is full of confusing and misleading information. Books on the subject often contain huge amounts of useless info, and internet forums often have conflicting or just plain wrong answers to offer. The idea behind this book is to give an accurate detailed account a tested method to grow Marijuana, and presented it in a linear way so that you can read this as you go.

If you are looking into becoming a big-time commercial grower this book is probably not for you. You want one of the countless other books that discuss the logistics of such an endeavor. This book is for the person who, for one reason or another, chooses to use Marijuana, but are tired of paying exorbitant fees and dealing with shady people. For me personally it is due to the fact that I'm getting older and I worry I might not be able to find someone to sell me the stuff for too much longer. This book was developed by one full-time employed person. Every method used in this book has been tested to find the easiest and least time consuming methods possible in order to balance the growing with everything else going on.

Although weed growing doesn't have to take up too much of your time, it is hard to get away for too long while growing since they need at least some attention every other day or so, there are ways to deal with this problem but I don't really talk about them in this book because I haven't tried them myself.

I'm not going to put a section on security in this book as the dated Marijuana laws are soon to be abolished and we will be free to cultivate this beneficial plants as we wish, but a good rule of thumb until that day is to not tell anyone about it.

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Chapter 1 – Supplies and Equipment

The first thing you need to do is get the equipment you'll need. Online retailers are an amazing resource for gardening supplies that are hard to find such as grow tents and HID (high intensity discharge) lights. If you don't have a local hydroponics shop, you'll likely have to purchase some things online. If you are uncomfortable shipping such things to the location of the grow, you could have it shipped to a brother's house or something like that, but that is probably not necessary.

You will need

- Grow tent: at least 4' x 4' x 6' [explained below] (around \$200)
- Air-cooled HID light bulb reflector with 6" duct holes and glass safety lens (around \$150)
- HID light bulbs: 250 watt metal halide (MH) bulbs and 400-watt high pressure sodium (HPS) bulbs [further explained below] (around \$40 for 2 bulbs each if you don't buy the bulbs from a gardening website, the sylvania and plusrite bulbs are fine)
- Digital Light Ballasts: New digital ballasts are often switchable between wattages and work for both major types of HID light bulbs (around \$150)
- 6" Duct Fan: at least 400 cfm (Cubic Feet per Minute) centrifugal fan (it doesn't matter if the tent only supports 4" ducts just adapt the duct from 6" to 4" for the exhaust (around \$100)
- Router Speed Controller or Fan Speed Controller (the same thing, to be used with the duct fan ONLY) (around \$20)
- 6" Ducts and Duct tape: enough to connect the light reflector to the exhaust vent of the tent, with a couple of extra feet to spare for this and that. If your tent has 4" exhaust and intake vent holes, you will need a couple of feet of 4" duct too (around \$30)
- Metal Support for exhaust vent - if your grow tent's exhaust vent is 6" then just a solid unbendable duct piece will give the exhaust vent much needed structure, if the exhaust vent on the tent is 4" get an unbendable 6" to 4" duct adapter (around \$20)
- Metal duct piece to redirect duct fan intake - powerful duct fans in a tent can suck themselves up against a wall, blocking the intake for the fan, rather than run an intake duct, use a solid, unbendable piece of metal that will redirect the intake upwards. (around \$20)
- Single pass carbon filter that will fit your exhaust vent (4" or 6" depending on your grow tent) (around \$80)
- CAP HL-3e or similar light controller [explained below] (about \$100)
- shop light with 13 watt CFL bulb [explained below] (about \$20)
- 3 Gallon Smart Pots - start with about 9 of them, no more than that in a 4' x 4' tent, as your skills improve, you may need less (about \$70)

- Circulation fan - A small reliable fan that can keep the air moving well inside the tent (around \$40)
- Hydroponic plant nutrient chemicals - General Hydroponics 3-part system works well, I've heard good things about Botanicare's Pure Blend Pro line (make sure you get the Bloom for Soil chemical if going the Botanicare route) (around \$60)
- Hydroponic pH up and down chemicals - to raise or lower pH value of water or nutrient solution (nutrient solution unless otherwise directed) (around \$20)
- pH meter with buffer solution and storage solution - pH meters are a headache, KEEP UP ON PH METER MAINTENANCE (around \$80)
- Growing medium - potting soil [explained below] (around \$70)
- 24 hour outlet timer - I recommend an outdoor digital timer by Intermatic. (around \$20)

There are other odds and ends too great to mention here like pruning shears and spray Bottles, but this list is all the important big ticket and hard to find items you will want to acquire first before doing anything.

The lights that are used in marijuana cultivation are extremely bright and would look odd to neighbors if they could be seen from a window. Marijuana plants also need to have a light controlled environment to trigger and maintain the bloom or flowering stage when the plants get big enough. For these reasons, a grow tent is crucial to a personal stash grower.

An air-cooled reflector with 6" duct holes and a glass safety lens is important for a couple of reasons. One reason is the fire safety aspects. HID light bulbs should be used in an enclosure to prevent hot glass from starting a fire in the unlikely event of a light bulb exploding. The other reason is that HID light bulbs produce a lot of heat as well as light. An air-cooled reflector is about the only way to manage these high temperatures in a small enclosure like a grow tent. A duct fan will connect to one side of the reflector and an exhaust duct connects to the other side, creating a path for the hot air to escape the tent, minimizing the effect of the heat being generated by the HID light bulb. Many growers use an intake duct for moving fresh air through the light reflector. I don't like this approach because it focuses so much on getting fresh air through the light reflector and not enough on getting fresh air into the grow tent in general, not to mention dealing with an intake duct that will likely be in the way all the time, this method uses a more passive intake approach. The fan hangs next to the light reflector, they hang from chains attached to the tent frame (explained in detail in chapter 3) This setup fits nicely into a 4' x 4' tent.

Because a 400 cfm fan is quite powerful, a good duct fan can suck itself up against a wall, blocking the air flow and damaging the connection between the reflector and the vent fan. At hardware stores they sell metal elbow joint pieces that you can attach to the intake of your duct fan to avoid this problem. The router or fan speed controller is to control the speed of the duct fan, you might not need the duct fan at full blast all the time.

Digital Light Ballasts are a relatively new technology that make using different types of HID light Bulbs less of a hassle. Traditional magnetic ballasts only work for one watt output and for either HPS or MH, not both. Not only do digital ballasts work with both HPS and MH light bulbs, but many of them are switchable between different watt outputs as well. You will want to run a 250-Watt bulb for Vegetative growth and at least 400-Watts for flowering, I'd recommend getting something like a Lumatek switchable digital ballast. They make one that can be switched from 250-Watts to 400-Watts, ideal for the average personal stash setup.

HID light bulbs are different than most other light bulb types in a lot of ways, one way is that if an HID light bulb is switched on and off, it can damage or destroy the light bulb. An HID bulb needs to remain inactive for 15 minutes after being powered down to avoid what is called a hot re-strike. A light controller like the CAP EL-E3 mentioned above will prevent hot re-strikes. Any intermittent power failures will cause hot re-strikes and destroy your HID light bulbs, which is why I listed a light controller as a necessary part of this setup. The CAP EL-E3 has another feature which I find indispensable to an easy going grow operation, it has a high temperature shut off value that can be set by a knob on the light controller, this will shut down the HID light in the event that the temperature gets too high. If you forget to open that window, turn on that air conditioner, your duct tape comes loose on the exhaust vent etc. No Problem, the light will shut off when the temperature reaches 90° F (or whatever temperature you set the shut off value to be) A red light will come on after an overheat and will remain flashing until the power cuts out to let you know there was a high temperature shutdown, so you know you should check out the grow tent for problems.

The temporary shop light can go anywhere out of the way in the grow room, it is there as a backup to the HID light during those times that the light controller shuts down the HID light to avoid long interruptions to the plants' controlled light cycle. A supplemental LED or fluorescent light instead would provide the plants with a little extra light and also function as a backup to the HID light.

This method was tested using Smart Pots to hold the medium. (medium in gardening refers to the substance the plant is in, this method uses potting soil as the medium) I'm not sure how much of a difference it made, but I do like Smart Pots, they are hard to over water.

You'll want a potting soil mix with excellent drainage. I typically use a mixture of top soil, perlite, and vermiculite mixed at a 3:1:1 ratio, that's three parts soil, one part perlite, one part vermiculite. Avoid using premixed potting soils like miracle grow, the time released nutrients they add to them can often be too strong for young seedlings. I also add 2 tablespoons of dolomite lime per 3 gallon pot.

You'll need seeds, but unless you really have no choice, do not use regular bag seeds. If they are still around, nrvana-shop.com (or nivana.nl) is a great place to order some feminized seeds from. Feminized seeds make it possible for a full time employed person to have a garden full of delicious feminine nugget plants without the hassle and room required for cloning and mother plants etc.

I've seen 3 of 3 normal, un-feminized seeds, all come out female, I've also seen 3 of 3 turn out male, which is why I say go buy some feminized seeds. If getting these seeds is extremely difficult, you might want to consider using regular bag seeds for your first grow until you get down the process of pre-germinating and planting your Marijuana seeds (the chapter on germination describes my high success rate seed starting method in detail)

Chapter 2 – Getting Your Shit Together

Congratulations on purchasing a grow tent, unfortunately many are less than 100% light leak proof right out of the box. It's a pain in the ass, but I recommend getting some velcro and sewing it on any window or door flaps that are not secured in any way. Marijuana needs to have complete darkness during it's night cycles, if it doesn't it can negatively affect the plants. For example, light leaks during flowering can cause female plants to turn hermaphrodite, which can pollinate your female plants and fill your nuggets with unwanted seeds. A good way to measure how much light can get in is by inspecting how much light escapes the tent when the HID light is on in the tent and the lights are off and it's dark in the room outside the tent. You can also do the opposite and see how much light enters the tent from inside the tent when the light in the tent is off, just make sure you do it right after lights out so you don't disturb the lights off cycle too much.

Tents usually come with mounting brackets on the ceiling to hang lights from, the tent I got had a very crappy mounting bracket, so I just used those rock climbing caribeaner things to hold the light reflector by chains from 4 different caribeaners located on the poles in the front and the back of the tent, opposed to the poles on the side of the tent.

In my setup, 2 more caribeaners hold a chain that goes across the ceiling of the tent that another chain hangs from by an S hook that the duct fan hangs from. There is a small piece of duct, a lot of duct tape, and 2 of those duct clamp things you screw to tighten around ducts to attach the fan to the light reflector. It's good to use the clamps to hold it in place because you will have to disconnect the duct fan anytime you want to move the light. I usually just disconnect the clamp from the fan side and take the S hook the fan chain is hanging from and move it to one end of the chain going across the ceiling to get it out of the way while moving the lights.

As for the exhaust duct that connects to the other side of the reflector. make sure the piece of duct you're using is stretched out about as far as it can be to connect with the light reflector when the reflector is in the lowest position it will need to be in, that way when you move the light up higher as the plants grow, the duct will get shorter. My tent has a 4 inch exhaust duct, but my reflector and fan have the 6 inch duct size, I use a solid metal piece that adapts a 6 inch duct to a 4 inch duct right at the exhaust duct hole of the tent. I use one of those duct clamps to hold it to the cloth of the tent. This not only gives you something to duct tape the top of the duct to, but it is easy to install a carbon filter on the outside of the tent mounted on the top of the solid metal duct adapter piece. tape the crap out of the exhaust duct piece at the bottom on the light reflector and at the top of the tent.

I like to set the reflector a little over a foot above the tops of the pots when I am starting off. With a 250 watt light bulb in there the plants get adequate light and I don't have to worry about moving the reflector for a while.

You'll need to setup all the electrical connections, as in plug everything in, make sure you're using a quality outdoor timer, crappy indoor timers have the load running through the timer rather than acting like a switch box, using crappy indoor timers with high powered light ballasts, these timers will fail quickly and will not be able to supply enough power for your lights. People typically use an 18 hours on, 6 hours off lighting schedule (before the flowering phase that is). I usually try to coordinate the lights out phase with when I leave for work.

You will want a circulation fan in your grow tent to not only circulate air, but also to point at the light reflector to keep the air directly below it cooler and to move the leaves of the plants to help them grow stronger.

Having the plants too close to the reflector can be a problem if the heat isn't properly managed properly. Keep in mind that even the lower powered HID lamps like 250 watt light bulbs produce a lot of heat. If you up the ballast and bulb to 400 watts, it will be almost twice as hot as the 250 watt bulb gets, so a reflector with a 400 watt bulb might need to be further away from your plants than a reflector housing a 250 watt bulb.

I have a thick piece of diamond plating that I keep my light ballast and other electronic devices for the grow on top of for extra safety. All that goes on a larger rubber mat designed for the trunk of an SUV that is right up against one wall of the tent. A rubber mat is good because you will be using and working with a lot of water. I also keep a flame defender self contained sprinkler system mounted in a corner of the tent just in case.

About light bulb usage, I would log the dates and the amount of hours per day each light bulb is running for in order to determine if a bulb should be replaced or not. Popular opinion on the internet is to only use a light bulb twice, but I've used the same 250 watt light bulb for vegetative growth and the same 400 watt bulb for flowering since I began and those bulbs haven't reached half of their expected life. That is when I plan on retiring light bulbs, if it's rated for 24,000 hours, I'll retire it when it hits 12,000 hours.



This picture shows the old way I used to mount the duct fan, similar to the new way. That metal piece attached to the duct fan kept falling off only duct taped like it is in this picture, bungee cords fixed that.

Chapter 3 – Dirt (everything useful I know about dirt)

Rather than worrying about finding an adequate potting soil, I highly recommend making your own potting soil to use as a growing medium. A proper potting soil for marijuana cultivation is basically top soil mixed with vermiculite and perlite. Vermiculite and perlite are soil amendments that give the potting soil better drainage, which allows the roots to breathe and helps the soil evenly distribute the water it receives. I recommend using Scott's premium top soil because it works well and I once read an analysis of different soils that rated Scott's top soil as well as any other more expensive alternatives.

The Ratio of soil to vermiculite and perlite is 3 parts soil to 1 part vermiculite and 1 part perlite. The Vermiculite you get can be coarse or fine in my experience, but make sure the perlite you get is the coarse type, it should look like little white chunks instead of having a more powdery consistency.

Before mixing the amendments with the soil to make potting soil, you will want to pasteurize your dirt. This is not a fun process, but the benefits outweigh the trouble you'll go through. You will need an oven, a couple of deep baking pans, and hopefully a tarp to work on to minimize the mess you are about to make. Preheat the oven to 350 F and fill the baking pans with dirt. Each batch of dirt is going to bake for about 30 minutes, the dirt will be stirred up twice, every 10 minutes until the 30 minutes is done.

Depending on the potting soil, the fumes from the pasteurization process can be quite overpowering. Not just bad smells, it could make you lightheaded and dizzy too. Maximize the ventilation in the room you are pasteurizing the soil in. Use AT LEAST one exhaust fan.

I have done this and still had gnats survive this kind of pasteurization, so you can try a little hotter or a little longer if you like. I usually put my oven on 365 because it sucks, but you don't want to go to crazy with the pasteurization because you can kill too much useful edophons (living organisms) in the soil.

After the soil has been pasteurized, get a big 30 + ounce container you can use to scoop the soil and the amendments together with. Mix them all into a strong garbage bag, scooping 3 containers of dirt per every one container each of vermiculite and perlite. Before you mix up the contents of the garbage bag, you'll want to add the dolomite lime. Top soil contains peat moss, and you'll also be using straight up peat moss to start the seed in in the center of the pot, and peat moss can get acidic over time. In order to prevent soil pH issues, you will want to add a product known as dolomite lime to your soil. Dolomite lime is usually sold as fine chunks, almost a powder. You don't want dolomite lime that is too coarse

Try to estimate how many pots full of growing medium that garbage bag contains and add dolomite lime accordingly. For example, I use 3 gallon pots, and when I mix a batch of soil out of the oven with the amendments it fills about one and a half 3 gallon pots, so I mix 3 heaping tablespoons of dolomite lime per garbage bag before I mix it all up.

Thoroughly mixing your growing medium is very important, make sure that bag is well closed up and tumble it around like a cement mixer. When the medium is mixed add it to your pots and start again until all of your pots are full of growing medium. Be sure to shake the pot around a bit so that the growing medium settles in the pot to make sure the pot is actually full, you might think a pot is full, but if the growing medium is not settled in the pot, it might not be.

The final step in preparing your growing medium is making a big fist sized hole in the center of the surface of the potting soil and filling the hole with sphagnum peat moss. Sphagnum peat moss retains water well and is an excellent medium to use for starting seeds in, and by starting the seeds in the same pot they will finish in you avoid the hassle and stress on the plants of transplanting. You will need to water the pots thoroughly before you plant any seeds in them, there will be more information on that in the next chapter about germination.

Considering what a pain in the ass all of that might seem like, This is probably a good time to mention soil recycling. Soil recycling will save you lots of time and work, and some money too, all it requires is a big plastic container with a lid that will fit all the growing medium you use per grow. Instead of throwing your dirt out and starting from square 1 again, put your hands deep into the dirt and loosen the dirt around the root ball until you can remove it. Smack the root ball around inside the bin to remove any excess dirt. Then dump the remaining growing medium from the pot into the the bin and search it somewhat for more roots. It's not important to remove all of the roots, just most of them.

You'll need to keep the bin outside, preferably in the sun, but more importantly under cover to avoid too much moisture entering the container. Use the smallest drill bit you have to put hundreds of tiny holes near the top or on the lid of the container. By letting the soil chill for at least 4 months, it will do magical things in that bin and practically be ready to use again after pasteurization and some more dolomite lime, 2-3 tablespoons per pot again. Since the dirt has to chill for at least 4 months, when you are done growing you will not be able to use the dirt from that grow that just finished to grow in right away, but if you make more fresh potting soil one more time, you'll be able to rotate the soil you use from then on instead of buying and mixing new potting soil.



This is a root ball from a Marijuana plant freshly removed from the dirt

Chapter 4 – Germination

The first step a seed goes through when you are trying to grow it is germination. If you throw a seed into some soil and water it there is a good chance the seed will germinate, but this chapter will explain a method that will allow you to successfully germinate any healthy seed. Which is important when dealing with expensive feminized seeds that are often sold in increments of only 5 seeds at a time.

I have never bothered using anything but plain tap water to germinate a seed, but the water should not be fresh out of the tap. It should have at least 24 hours to become room temperature and to give the chlorine time to oxidize out of the water.

You'll need some paper towel and a resealable container, I usually use a ziplock hard plastic container.

After you have prepared some water and ideally after you prepared a pot full of dirt for the seed, get a paper towel and rip it into smaller pieces about 4 inches in width. Soak the paper towel in the water by pouring it into the container. It's good if the container is wet, but it shouldn't have any standing water left in it, so after the towel is soaked, dump out the excess water. Then place the seeds you wish to germinate inside the paper towel piece and carefully wrap it up and put the lid on it and store in a cool dark place, checking every 12 hours to see if the seed has been germinated.

Germination occurs when the hull of the seed cracks open to expose the first little root of the plant. If the seed is left in the towel too long the root will come pretty far out while still inside a moist paper towel, but this is bad if this happens because it will be extremely easy to damage in that state, it is best to put the seed in the growing medium as soon as the root is exposed the slightest bit.

At this point you will need pots filled with growing medium (mixture explained in chapter 3) that has been thoroughly watered to plant the seeds into, you'll need about 3 gallons of water for six 3 gallon pots, and also I highly recommend having a good pair of big tweezers you will be able to use delicately.

By germinating the seed before putting it into the soil and minimizing the damage of planting a germinated seed, the life of that seed is practically guaranteed. The biggest danger your seed now faces is drying out. Thoroughly watering the soil before planting the seed will help a lot, but in order to further guarantee success get a fine mist spray bottle to keep the area around the seed extra moist twice a day, and you could even make humidity domes out of clear plastic cups to keep over the seed to prevent the peat moss in the middle from drying out.

You'll want to stop spraying the soil and remove the humidity dome cups after the first true leaves are showing. The first thing you see that look like leaves are actually called cotyledons, true leaves start off tiny and grow much bigger from the center of the cotyledons. Every once in a while the seed hull might be too thick for the plant to properly remove it. You can use a pair of tweezers to try to crack the seed hull that is holding the cotyledons together and preventing the leaves from growing, but be extremely careful if you do this. Make sure you give seedlings at least 3 days to drop the seed hulls on their own, and a circulation fan in the room will also help knock the seed hulls off of the plants

Chapter 5 – Vegetative Growth Phase

Vegetative growth is what they call the time that a plant grows before it reaches its flowering stage. All you have to do during vegetative growth is water the plants when they need water and add nutrients to the water later on when the plant needs it and maintain good air circulation and lighting. You'll have your lights on an 18 hours on, 6 hours off, 24 hour schedule using your outlet timer. Some people leave their lights on 24 hours a day, but that isn't natural and probably causes the plants stress, not to mention the stress on your gear being on all the time. The only thing in the grow room that stays on 24/7 is the duct fan, and I try to shut that off for at least 15 minutes once a week as a maintenance shutdown.

This is probably as good a time as any to mention controlling the temperature in your grow room. An ideal temperature is right around 75 F, I usually try to keep the temperatures in my room below 85 F. They say any more than 15 F temperature change can stunt your plants growth, so try to keep it balanced between lights on and lights off. This can be difficult to manage, If you are using an AC unit with a temperature setting it's not difficult, but way too power consuming if an open window is an option, but if you are trying to use an open window and a fan, you might have to close the window when the lights go out to keep the room from getting too cold, but what if you forget to open the window before the lights come on again? The EL-E3 light controller and backup cfl light come in handy in this scenario, I set the temperature setting on mine to a little under 90 F, so when the temperatures reach that point, the HID light goes out, but the photo period remains uninterrupted because of the backup light. When the temperatures get 5 degrees cooler in the room and 15 minutes have passed the HID light will come back on. Also a red light on the switch will flash, indicating there was a high temperature shutdown. This is very useful because it lets you know there is some kind of problem with your setup. Maybe it's the duct tape connection on your exhaust vent that came loose causing the overheating, there could be many factors that contribute to overheating.

It's easy to tell when you should water your plants, you should water the plants when the soil in the pots are dry. Just stick a finger into the dirt, close to the outside to not disturb the roots too much. test about 2 inches down in the soil for moisture. If the soil moves easily and feels dry that deep, the plants could probably use a watering. The roots need to breathe and Marijuana plants, like many plants, prefer the soil to dry out a bit before a watering. If you see that the leafs are wilting, drooping downward, the plants need to be watered. Be careful though because an over watered plant will have drooping leaves too. Like many plant symptoms, what the symptom means can only be determined taken in the proper context. If you water a plant and the leaves are drooping the next day, there's a good chance that it is drooping due to over watering, but if it hasn't been watered in a while, the problem is likely that it needs water. Healthy plants should generally have leaves that are pointing out or up, not down.

I usually try to water all the plants at the same time, simplifying things tremendously. Smart pots are very useful for this because the open design allows better air flow, making over watering a plant more difficult. I will often water all the plants in a garden even if 1 or 2 pots are not as dry as the others, and I never have over watering issues.

As far as nutrients for your plants are concerned, I prefer to use hydroponic nutrient chemicals because they are so easy to use and give good results. A plant in the right conditions will not usually need any nutrients until it has grown big full leaves and about 3 nodes, or points on the main stalk that leaves come from.

Giving plants nutrients too early is an easy mistake to make. Some people like to wait until yellowing shows on leaves before feeding the plants anything, but in my experience waiting to see the yellowing can make it difficult to ever get a handle on stopping the yellowing. I usually give my plants a small dosage of an extremely weak nutrient chemical known as liquid karma, the N-P-K rating is 0.5-0.5-1 before the first feeding, which is usually about 2-3 weeks after it has been planted, depending on how well it has been growing. The next watering I use the seedling dosage recommended by the company that makes my veg nutrients, which is currently General Hydroponics 3-part flora series. From that point on, with the General Hydroponics 3-part Flora nutrients at least, you will give the plants the recommended vegetative dosage every other watering until they need something more, then they get the recommended aggressive growth formula every other watering. In my experience with the General Hydroponics Flora series of nutrients, you might need the aggressive growth formula as early as week 5 of vegetative growth.

I store my water and mix my nutrient solutions in 1 gallon Arizona iced tea bottles. The standard gallon of milk jugs spring leaks very easily and are not up to the abuse of mixing nutrients in them. Try to find Arizona iced tea gallon jugs to store and treat your water. Always fill your jugs as soon as possible after a watering to give the water as much time as possible to get rid of the chlorine into the air. I usually let them sit on a rubber mat with the cap off.

It can be too much of a shock to give plants nutrient solution when they need a watering, I always give plants a cup of plain water before I give them the nutrient solution. The water should be pH balanced to be close to pH 6.5. The way I do it, I use 16 oz cups to water plants, I give a plant one 16 oz. cup of water and then three more 16 oz cups of nutrient solution, the nutrient solution should also be pH balanced to be around 6.5, which depending on the nutrient dosage, might happen without adjusting the water with pH up or pH down chemicals. If you don't have a pH meter or pH up or down Chemicals you will not get as good results as you would have if you were pH balancing your water, and once you get used to it, it's not that bad. pH testers generally need to stay moist, they usually come with a sponge to keep in a cap with the probe of the pH tester to keep it from drying out. They also need to be calibrated every so often using a buffer solution that the meter can test against.

The only time I give my plants untreated tap water is during a flush. Flushing should be done once at least every two months, but I usually flush every month. Flushing is needed to clean the soil so that nutrients can be sucked up by the plants. Salt build-ups occur in the soil and the plant needs the pot it's in to be filled with approximately three times as much water as dirt it contains. So a 3 gallon pot for example will need 9 gallons of water for a flush. For six 9 gallon pots, that is 54 gallons of water to treat, fuck that.

Just go to a hardware store and get some tubing that you can attach to your tub faucet and secure it into place with a small one of those duct clamp things. I used a series of tubes and pipe joints to make a two prong fork that goes on both sides of a plant while flushing, but a single tube will work. If you want to be lazy you can just have the end of the tube pour water into the pot, but a better solution is to duct tape up the end of the tube and drill lots of tiny holes on one side, this will allow the water to come out in a wide area to flush the plant, and the tiny holes will cause the water to become aerated. That plastic tubing can be quite stiff, so you might need an elbow joint to get this design to work properly, a piece sticking straight down from the faucet, and a piece at a right angle with small holes and a capped end. Basically, the better the design, the less you'll have to move a plant around during flushing to properly flush it. If you have a lazy design it might take 40 minutes to properly flush a plant, an open tube into the plant will need to be at a slow pace in order to not disturb the roots too much. Also, make sure the water is close to room temperature coming out of the faucet and do your best to maintain the

temperature. I've had several instances of giving plants too hot or too cold water during a flush with no signs of anything bad happening, but I would still be careful. If you only have a shower stall you will have to get creative, but I imagine there is some kind of product at the hardware store that would allow you to run a hose from the shower head.

I usually push a freshly flushed plant to the back of the tub and put a thick plastic hanger underneath it to assist with the drainage. When I get three plants finished in the tub, I usually give the plants a fresh dosage of nutrients after they had a minute to drain (about 4 16 oz cups, or about half a gallon). After they have another 5 minutes or so to drain the nutrient solution, I move them to a folded over towel to suck up some of the excess moisture for another 5 minutes, then I move them back into the tent after that. If you do all those steps, the water won't be a problem in the grow tent.

If your plants are growing optimally, at 6 weeks old they will be over 1 foot tall, have plenty of branches, and be ready for flowering. If at 6 weeks your plants are only just about a foot with weak small branches or smaller, let them grow longer, but ideally they will be ready to go at this point. You can always veg them longer and bigger than they need to be, but big plants can stretch a lot during the flowering phase of growth, and HID lights are powerful, but they perform well at a certain distance, and tall plants are hard to fully light.

I typically initiate the flowering phase after 7 weeks or 49 days of vegetative growth. Initiating the flowering phase is as simple as changing the schedule of the lighting in your grow room... (continued in the Chapter 6 – Flowering)

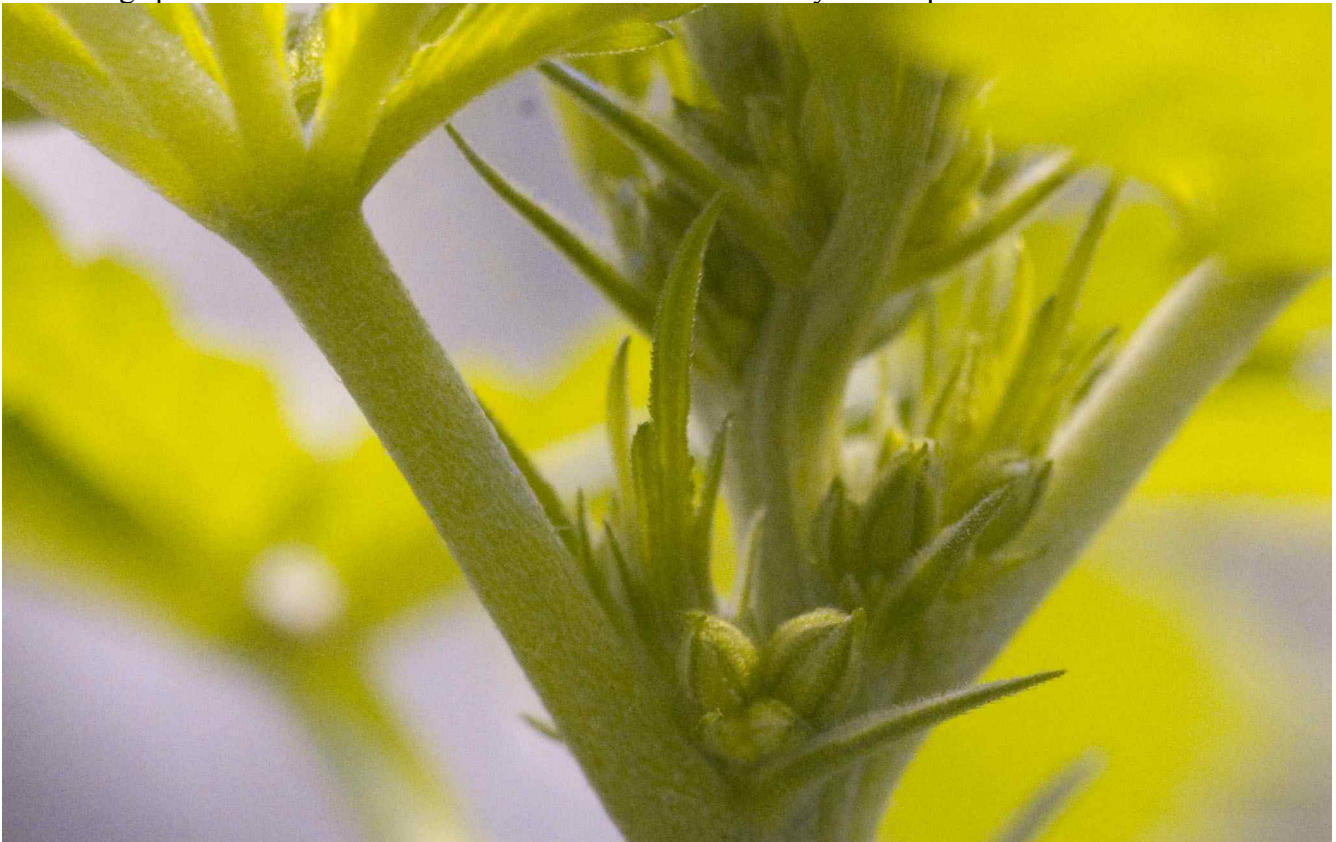


Notice the 2 prong design and the dark water coming out of the plant after flushing first began versus the relatively clean looking water coming out of the plants that were previously flushed.

Chapter 6 – The Flowering Phase

When your plants have had adequate time to grow it's time to initiate the flowering phase of growth. The flowering phase is the time when your plants will grow the delicious nuggets you are after. All you have to do is change the schedule that your lights are on and off for. Typically people use an 18 hours on, 6 hours off schedule for the lighting during vegetative growth. For flowering you change the light schedule to an even 12 hours on, 12 hours off. This simulates the days getting longer, which sends a message to the plants to initiate flowering. Plants will usually need to grow at least 80 days from the time that you change your lighting schedule until you have mature nuggets that are ready to be dried and cured (that's right, they are not ready to smoke right off the fresh plant, more info in the next chapter, drying and curing) When Flowering begins, plants will need much less nitrogen in their diets. Many companies that make nutrients make a vegetative formula and a flowering formula. Some nutrients like the General Hydroponics 3-part Flora nutrients get mixed in different ratios for the vegetative and flowering stages, as well as a transitional ratio where everything is even.

In my experience, Flora by General Hydroponics is better for vegetative growth than it is for flowering. The recommended dosages of the chemicals in the flowering phase includes absolutely no nitrogen, and in my experience this does not work out well. I like to use the GH flora series nutrients for the veg period because they work and are not too expensive, but for the flowering period I use Botanicare's Pure Bloom Pro for Soil product. It is meant to be used every watering unlike the GH flora series and generally does a much better job. I also use Liquid Karma by Botanicare and a teaspoon of Grandma's unsulphured Molasses, alternatively at first, then both together eventually. I use powdered pH adjustment products, pH up and pH down by General Hydroponics to adjust pH. I like using a small measuring spoon because nutrient solutions mixed the same way will require the



This is a male plant 9 days into flowering, if you have a plant like this, cut it down immediately! A female plant will have many long pistils instead of round pollen sacs.

same amount of pH up and down, if you do similar nutrient solutions from week to week, adjusting the pH can be as simple as knowing how much to fill up a spoon before you dump it into some water or nutrient solution. For example, I typically fill three jugs to water six 3 gallon pots. My water is typically 7.5 pH out of the tap. Two of the three jugs will be made into nutrient solution, the other jug I know needs a 1/8 teaspoon spoon filled about 3mm away from the top of the spoon with pH down chemical in order to get plain water that is 6.7 pH. Nutrient solution chemicals typically lower pH, so for a typical flowering feeding with 25 mL Pure Bloom Pro for Soil, 10 mL Liquid Karma, and 1 teaspoon of molasses (molasses doesn't affect pH much at all) per gallon of water, I typically need to fill that same 1/8 teaspoon spoon over filled with pH up chemical, and I get nutrient solution with a pH right around 6.5. Molasses can be used as a plant growth enhancer during flowering, apparently many "bud booster" products are made mostly of molasses and water. I've seen side by side comparisons that suggest that it works well, but I never did a side by side myself, I just use it all the time. I usually use 1 teaspoon of Molasses per gallon.

Flushing your plants at the end of the flowering phase is important, buds will retain excess chemicals from the fertilizers that you don't want to taste or smoke. You'll want to clean the soil out and more or less starve the plants of fertilizers, this is typically referred to as the final flush. During the final flush, you'll want to flush your plants at least once and not feed the plants anything but water until the plants are ready for harvest (the flushing process detailed in the vegetative growth chapter) They should go without nutrients for at least one week after being flushed. Healthy leaves will become yellow and possibly red or purple as nutrients are sucked out of the plant, this is totally normal, and if you follow my lead using home mixed potting soil and using Botanicare Pure Bloom Pro for Soil during flowering, you're plants should actually get to this point without all the leaves dying off already, which basically stops nugget growth. This may happen your first couple grows until you get comfortable with the process, don't get discouraged, learn from your mistakes.



Chapter 7 – Trimming, Drying and Curing

Trimming, drying and curing nuggets is a simple but time consuming process. After you cut down the plant, hang it upside down in a dry (no more than 40% humidity ideally) area and trim off many of the larger fan leaves that are easy to get at. Do not throw these leaves away, if they have lots of visible crystals on them you can use it to extract hash from, if not, you can use it to make some good cannabutter. (further explained in the next chapter) Leave the plant in a dark place until the nuggets feel dry. Usually after at least 5 days.

Even though the nuggets feel dry, they still have plenty of moisture retained deep inside the nugget. The next step is to put the nuggets into jars to cure. Cut off the rest of the larger leaves that you don't want to smoke and cut the nuggets themselves off the branches and into jars. When you first seal nuggets up after cutting them off the branches, you want to check the nuggets every half hour or so to make sure the moisture level inside the jar isn't getting out of control. The best way to check this is by feeling the nuggets, they shouldn't feel too moist to smoke on the outside, if they do you should take them out of the jar onto some wax paper or something for 30 minutes to an hour. After the moisture level evens out at a good level, you have to "burp" the nuggets by opening the jar for 15-30 minutes at a time to let off excess moisture less and less frequently, usually something like once a day for a week or two.

No matter what, if they feel moist leave them out on a piece of wax paper or something for 30 minutes to an hour before putting them back into jars. If you cut fresh nuggets off a tree, or even drying nuggets that you think are dry into a sealed jar for over 24 hours, you are seriously risking getting your harvest moldy!!

Until you get the hang of curing, don't try to get it perfect, try to get it done without mold, so when in doubt, dry it out.



“Canning jars” these are called, they have a rubber seal and a 2 part lid, these are pretty standard equipment for curing nuggets

Chapter 8 – Hash and Butter

The best thing to do with the tiny leafy nuggets and leaves from the plant are to extract hash from the leaves using extraction bags that can be bought on amazon.com, for example and then processing that same plant matter again to make butter after you make hash out of it.

Making hash the right way is tough, I still haven't gotten the hang of it, you want to be gentle because if you use too much force on the leaves the trichomes will break up and form an unretrievable green slime on your extraction bags. Making butter is much, much easier.

The process of making hash as I understand it involves getting extraction bags, which are bags that have tiny screens on the bottom to separate the trichomes from the leaf using ice and water and to catch hash on the lower screens. It is easier said than done, but I believe it's key to have a lot of ice and a lot of time to hand mix the leaf instead of using an electric mixer or something that might break trichomes in the process. If you can't stretch your bags around the end of the container you are using as they suggest, you have to at least stretch the bags around each other to prevent contamination of the lower filter bags.

After the screens have had enough time to collect the hash, pull one bag at a time out of the container and either hang them up to dry or just put them on top of some paper towel pieces on a table. When dry, the bag needs to be turned inside out so you can scrape the hash off onto a piece of plastic wrap. I usually use an old plastic card like an old gift card to scrape hash off the screens. Use rubbing alcohol when you are finished to clean the screens off for next time before drying them out.

Making cannabutter is basically the process of clarifying butter with weed leaves present. Add water and 4 sticks of butter to a big sauce pot at a medium-low heat. After the butter is all melted add at least an ounce of leaf to the pot and mix it up really good. Let it simmer on low to medium-low with the lid off until the surface of the water starts to look thick like melted butter, then simmer with the lid on. Simmer for at least 3 hours, some people say you get good results for longer than 3 hours, but people agree at least 3 hours. Try to stir the mixture every 20 minutes or so. You can always add more water if you need to in order to let it simmer longer.

After the mixture has had at least 3 hours to simmer and some more time to cool a little, cover the top of a container big enough to hold everything in the pot with cheese cloth held on tight with rubber bands to filter out the marijuana plant matter. Let the cheese cloth drain and the plant matter cool down for a little longer before squeezing the cheese cloth with the plant matter inside to squeeze out any remaining cannabutter.

Put the container in your fridge over night, in the morning there will be a thick layer of butter on top of the left over waste water below. I usually cut the butter into 4 equal parts, wrap them in tin foil, and put them in the freezer. I don't know if the waste water can be used for anything, I dump it down the drain.

Chapter 9 – Proper Bowl Cleaning

Blunts, joints, or bowls (pipes) it's all a matter of preference. Bowls can be convenient, but far too many people never clean them out or don't know how to do it properly. Some people give up on cleaning bowls and go to using disposable pipes made of tin foil when they can't smoke joints.

I would explain how to make a tin foil pipe, but tin foil pipes are dangerous, carcinogenic, nasty excuses for something to smoke out of. Never use a fucking tin foil pipe!

Glass or maybe stone should really be the only materials used in a bowl piece. You can get nice glass pipes on the internet for like \$10, or from a local head shop for about \$20.

Here's the deal, if you own a glass pipe, you need rubbing alcohol, kosher salt, and a sink that you can get really dirty temporarily. Q tips are also good to have on hand but not necessary, some bowls can't even fit a Q tip inside, but don't worry, you can still get that thing spotless.

The first thing you should do is run hot water through the bowl piece. Fill the bowl half way with water, cover all the holes in the bowl piece, and shake it pretty hard. Rinse and repeat until the majority of huge clumps of resin have come out. Next get your kosher salt and put a good amount into the bowl piece, hopefully about a teaspoon full, cover all the holes except the mouthpiece hole. pour rubbing alcohol into the mouthpiece hole and shake the bowl up like before. If the bowl isn't that dirty it might be spotless after repeating this once or twice, but if there is a lot of stubborn resin left inside the bowl piece, the bowl should soak in alcohol for at least a day. After soaking, another salt and alcohol shake session should be all it needs to be spotless.

Try to find rubbing alcohol with a flip top cap that can be used to spray a small stream of alcohol out at a time, this will make things easier and certainly save you some rubbing alcohol. I also recommend finding a small container to keep kosher salt in instead of pouring it straight out of the box, this will probably help you waste less salt during a cleaning.

When the bowls are all clean, get a sponge and soak all the resin stains in the sink with rubbing alcohol, rubbing alcohol will do a good job on those sink resin stains too.

Enjoy