HydraMax™

Deep Water Culture Systems

Guide to Recommended Growing Procedures

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We realize that there are many different grow styles and every grow has its own unique qualities. With this in mind, we have created this grow guide based on research we have done and cultivators we have talked to, like you.

Week 1 of Veg

- [ ] 1. After installing your system check that all Qwik-Lok™ connectors are in the locked position and that any other connections are secure.
- [ ] 2. Fill the system with RO (reverse osmosis) water or potable water with a parts per million less than 100.
- [ ] 3. When using a bare root clone make sure to fill the system just below the stem of the plant. If you are using a rockwool plant, fill the system just below the rockwool cube to prevent over saturation.
- [ ] 4. Plug in the pump for the system. Make sure every site has a good flow of water and aeration coming out of the circulator.
- [ ] 5. Set your water chiller to the desired temperature. Ideal range of 68-71F
- [ ] 6. We suggest following your desired nutrient's feed regiment. To add sterilization (H202 or Hypochlorous acid) solutions and nutrients to your system, start with your sterilization solutions first. Turn off the pump, open ball value below the funnel and add. Close the ball value and turn the pump back on. Allow a cycle of 30 seconds. You should repeat the process for each nutrient you will be adding. After adding all the nutrients check the pH of the water. If needed, pH adjustments should always be made after nutrients are added. Add pH to the system the same way you would nutrients. Always start small with pH up and pH down as it is very concentrated and a small amount will affect the pH easily. The pH can be checked by using an EC/TDS meter which can be purchased online.
- [ ] 7. Make sure the system's float valve is connected to a water reservoir, it will automatically refill the system as the water level drops below the set level.
- [ ] 8. Now your system is ready to start growing!
- [ ] 9. Check your system daily if possible. Make sure the ppm is in the correct range and also the desired pH level is reached. Add nutrients back into the system as needed. Example- Started week 1 with 150 ppm, a few days later the ppm dropped to 125. In this case you would add back 25 ppm to reach the desired level of 150 ppm.
- [ ] 10. If the ppm or the pH is not in the desired range, turn off the system, add adjustments the same way as explained in step 6.

Week 2 of Veg

- ☐ 1. Check the ppm and pH in the system. Remember to adjust ppm before adjusting the pH.
- ☐ 2. Add Nutrients to the system. The ppm should be higher[1] on week 2 than on week 1. Plants need more nutrients as they grow. Remember the order of adding nutrients. Start with sterilization solution, then base nutrients.
- ☐ 3. After adjusting the ppm and pH, turn the system on.
- ☐ 4. Set the water chiller temperature to 70°F.
- ☐ 5. While the system is operating, do a health check on the plants. Check each plant's foliage for spotting or discoloration. Lift the plant's net pot out of the system and check the roots. You want roots to be white with lateral root growth.
- ☐ 6. Check the ppm and pH of the system daily if possible. Add nutrients back into the system as needed. Example- Started week 2 with 225 ppm,a few days later the ppm dropped to 175. In this case you would add back 50 ppm to reach the desired level of 225 ppm.
- ☐ 7. Defoliating - Week 2 is a good time to lightly start cutting off large leaves at the top of each branch. This will allow more light to penetrate to the small lower branches. The goal is to train the branches to grow evenly in an upward manner in order to make a more manageable, consistent canopy.

[1] The ppm is typically nutrient dependent. We recommend that the grower consult their selected nutrient feed baseline chart.

Week 3 of Veg

- [ ] 1. Before making any ppm or pH adjustments it is time to do a full system drain and refill with fresh RO water. Make sure to have enough water in your reservoir to refill the system quickly. The water in your system can be poured down a drain or repurposed in your garden. Most areas allow this, but check to make sure it is permissible.
- [ ] 2. While the system is draining, conduct a plant health check. Check the leaves and also check the roots while the water is draining.
- [ ] 3. Fill the system to the same level as week 1 and week 2. Start the system. Make sure all circulators are working.
- [ ] 4. Follow your feed schedule and add nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- [ ] 5. Adjust pH if needed.
- [ ] 6. Set the water chiller temperature to 68°F
- [ ] 7. Throughout Week 3 continue lightly defoliating to allow better growth to all tops of branches.
- [ ] 8. At the end of Week 3 you can decide to start the flowering phase or continue to vegetative phase. This is up to the grower as some like to grow larger plants.
- [ ] 9. If you decide to start the flowering phase the system will need to be drained at the end of week 3 and refilled before starting the first week of flower.

Week 4 of Veg

Week 4 Veg only applies if you continue the vegatative phase. If you plan to start flowering, skip to the Week 1 Flower page.

- ☐ 1. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- ☐ 2. Adjust the pH if needed.
- ☐ 3. Lightly defoliate throughout the week. On the last day of vegatative growth it is good to defoliate more than usual so that each bud site will have enough light to start growing. You will not need to defoliate again until the end of Week 4 Flower. Keep in mind that defoliating style is completely up the grower.
- ☐ 4. Check the ppm and pH of the system daily if possible.
- ☐ 5. At the end of Week 4 you can decide to start the flowering phase or continue to vegetative phase. This is up to the grower as some like to grow larger plants.
- ☐ 6. If you decide to start the flowering phase, the system will need to be drained at the end of week 4 and refilled before starting the first week of flower.
- ☐ 7. If you decide to start flowering your plants make sure to set your light schedule to 12 hours ON and 12 hours OFF. During the night period the room should be pitch black. Any light leaks may stress the plants and cause slow growth.

When to move to the Flower Stage

This is determined by personal preference. If the grower has sufficient space for a large canopy and wants to grow massive plants to the lights, remain in the Veg stage. If not, move to the Flower stage. Keep in mind that if the root mass becomes too large, it could clog the system. Purchase a Root Riser from Hydra Unlimited if you think you will have a larger root mass.

Week 1 of Flower

- [ ] 1. Before starting make sure the water has been drained and refilled to desired level.
- [ ] 2. When adding nutrients to start the flowering phase the only change will be the type of nutrients used. Usually there is a Veg line and Flower/Bloom line.
- [ ] 3. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- [ ] 4. Adjust the pH if needed.
- [ ] 5. Check the ppm and pH of the system daily if possible.
- [ ] 6. During the Flowering phase you will not have much defoliating or plant training. This is a good time to dial in your environment for optimal plant growth.

Week 2 of Flower

- [ ] 1. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- [ ] 2. Adjust the pH if needed.
- [ ] 3. This week the plants will grow taller each day. Make sure to have support for the top branches if they get too tall. Most growers will use a net or plant cage for support.
- [ ] 4. Continue the week doing health checks on plant foliage and roots.
- [ ] 5. Check the ppm and pH of the system daily if possible.

Week 3 of Flower

- [ ] 1. Before making any ppm or pH adjustments, the system will need to be drained and refilled to desired water level.
- [ ] 2. Take this time while draining to do a health check on plant roots and foliage.
- [ ] 3. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with sterilization solution, then base nutrients.
- [ ] 4. Adjust the pH if needed.
- [ ] 5. This week plants will continue to grow taller. This is the last week of stretching (the natural vertical growth response in the early stages of flowering). Support your plants with another trellis net or adjust your trellis nets as needed. Continue the week doing health checks on plant foliage and roots.
- [ ] 6. Check the ppm and pH of the system daily if possible.

Week 4 of Flower

- [ ] 1. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with sterilization solution, then base nutrients.
- [ ] 2. Adjust the pH if needed.
- [ ] 3. Continue the week doing health checks on plant foliage and roots.
- [ ] 4. Check the ppm and pH of the system daily if possible.
- [ ] 5. On the last day of Week 4 Flower you can do a moderate defoliation (Day 28) We understand each grower has different definitions and expectations to what they may or may not want to remove. The defoliation process is determined by each grower. Some growers have “proven” methods to removing leaf mass from the canopy and training their plants, while others shape by interpreting the actual branch growth.

Week 5 of Flower

- [ ] 1. Before making any ppm or pH adjustments, the system will need to be drained and refilled to desired water level.
- [ ] 2. Take this time while draining to do a health check on plant roots and foliage.
- [ ] 3. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- [ ] 4. Adjust the pH if needed.
- [ ] 5. Continue the week doing health checks on plant foliage and roots.
- [ ] 6. Check the ppm and pH of the system daily if possible.

Week 6 of Flower

- [ ] 1. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with H2O2, Cal-Mag, then base nutrients.
- [ ] 2. Adjust the pH if needed.
- [ ] 3. Continue the week doing health checks on plant foliage and roots.
- [ ] 4. Check the ppm and pH of the system daily if possible.

Week 7 of Flower

- ☐ 1. Start the week by following your feed schedule and adding nutrients to the desired ppm. Remember the order of adding nutrients. Start with sterilization solution, then base nutrients.
- ☐ 2. Adjust the pH if needed.
- ☐ 3. Set the water chiller temperature to 66°F.
- ☐ 4. Continue the week doing health checks on plant foliage and roots.

Week 8 of Flower

- ☐ 1. Before making any ppm or pH adjustments, the system will need to be drained and refilled to desired water level.
- ☐ 2. If this is your last week of growth for the specific strain in your system, We recommend following the chosen procedures you feel comfortable with. For example: Start flushing the plants by using lower strength base nutrients and sterilization components only for the last week.
- ☐ 3. It is important to follow the desired nutrients bases directions if you wish to continue flowering. The goal is to effectively allow your plant to ripen based on what you've chosen to cultivate.
- ☐ 4. pH adjustments are always necessary if outside 5.5-6.5
- ☐ 5. At the end of Week 8 Flower your plants will be ready to harvest. The harvesting process also involves a personal preference such as wet trim over dry trim. Science proves a dry trim will have better results while others prefer not to trim at all and only remove the fan leaves, as the sugar leaves provide protection of the trichomes and flower over the dry and cure process.

A Word on Flushing/Leeching

Science tells us to only remove nutrients in perhaps the last few days prior to harvest, as doing this too early removes the plants ability to combat pathogens and molds. Obviously, the amount of nitrogen will have an effect on the overall THC/CBD's and terpenes being produced which can be artfully adjusted in accordance to regiment throughout flower cycle. (commercial)

From the perspective of the craft market farmer, the belief in starving the plant at the end to aid in flower maturity/removal of nutrients (salt content organically or synthetically derived) from the plant's ability to uptake.

The misnomer or myth is that water only will aid in the quality of the overall smoke. However, looking at TLO (True Living Organics) or KNF (Korean Natural Farming) not all the salt content will "flush" from the substrate at the end, as in these practices. The purpose of sustainability comes with generational use of substrate.

Drying Tips

The drying process is one of the most important steps in growing a quality flower. Drying slowly is the best way to get good flavor and quality. The drying process is another personal preference. While large facilities dry their product in a large production facility, a small craft farmer typically cuts their plants at the base of the stem and conduct a full plant hang to allow for a slow and steady drying process. The process will allow for a slow conversion of THC-A to THC and slow and steady at a low temperature to be preserved.

- ☐ 1. 60°F Room temperature
- ☐ 2. 60% Humidity
- ☐ 3. 10-14 Days

Grow Notes

Strain: _____

Date Started: _____

Date Completed: _____

Week 1 - Veg

Week 2 - Veg

Week 3 - Veg

Week 4 - Veg

Week 1 - Flower

Week 2 - Flower

Week 4 - Flower

Week 4 - Flower

Week 5 - Flower

Week 6 - Flower

Week 7 - Flower

Week 8 - Flower

Glossary of Terms

Canopy
The uppermost branches that form a continuous layer of foliage. The size of the canopy is typically calculated in square footage.

Defoliating
Stripping a plant of its excess foliage to improve light penetration and airflow.

Fan Leaves
The larger leaves that protrude from the branches. These leaves contain a minimal amount of trichomes and cannabinoids.

Flowering Phase
This stage occurs naturally when the plants receive less than 12 hours of light a day. Ideally, cannabis plants should receive 10-12 hours of total darkness to fully enter this stage of growth.

Flushing/Leeching
Ceasing to provide nutrients to the plant while only providing water. This is typically performed right before harvest.

Harvest
The final stage of cultivation. The buds must be removed from the branches, then trimmed, then dried and cured before they can be consumed.

Mold
There are many different types of mold (fungus) which can develop during the latest stage of flowering or during the drying process. Proper, early identification and treatment is critical for any crop.

Nutrients
Cannabis requires 3 main nutrients: Nitrogen (N), Phosphorous (P) and Potassium (K). All plant food labels will contain the breakdown by percentage of how these nutrients are represented in the food.

pH
The negative logarithm used to determine the acidity/alkalinity of aqueous solutions by calculating the H+ activity within the solution. Regularly monitoring the pH of your crop is critical for proper plant health. Further information on taking a pH measurement can be obtained here: https://youtu.be/ul9D-ONNdHg

Plant cage
Used to help support plants and encourages them to grow upright.

Ppm
(Parts per million) refers to the concentration of the particulates in your nutrient solution.

Qwik-Lok™
Patented quick-connect plumbing system used in Hydra Unlimited's HydraMax DWC systems.

Pathogen
An organism that causes disease in its host, such as mold.

Rockwool
A type of soilless grow medium created from spun volcanic rock that is used in hydroponic systems for all types of crops.

RO Water
Reverse Osmosis is a purification technology that removes ions, molecules, and larger particles from water.

Stretching
The natural vertical growth response in the early stages of flowering.

Sugar Leaves
The small protective leaves that cannabis buds grow around as the plant flowers. Sugar leaves produce fragrant trichomes which protect the plant.

Terpenes
Aromatic oils that are secreted by the resin glands of the flowers.

Trellis Net
Provides plant support and encourages the branches to grow upwards to allow for more light to penetrate the plants.

Trichomes
Crystallized glands on the plant that produce resin and contain the most cannabinoids (PotGuide.com, 2018).

Vegetative Phase
The stage of plant growth after the germination/seedling stage. Plants typically need more light during this phase.

Water Chiller
Attaches to the hydroponic systems and is used to keep water and nutrient solution temperature within the optimal range (65 – 70 degrees)