

# QUICK START DIY HYDROPONICS

Avoiding the 5 Most  
Common Mistakes in  
Hydroponics



## QUICK START DIY HYDROPONICS: Avoiding 5 Common Mistakes

1. **PROVIDE PROPER SPACING:** Hydroponics is an excellent way to grow small green leafy vegetables. Suspending the roots of your plants in a water/nutrient reserve allows the plants to exert more energy into expanding leaf growth, rather than developing extensive roots that are needed for retraining water in the standard dirt grow environment. To accommodate large foliage growth, it may be necessary to vacate some of the netpot spaces in-between your plants as overcrowding often leads to less overall production.



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- 2. USE GROW LIGHTS AND/OR FULL SPECTRUM (DAYLIGHT) BULBS:** While Small LED grow lights can be excellent for supplemental lighting, they rarely provide enough light by themselves to support your vegetable plants. Minimum light requirements for most household plants is 32 watts of light per foot of growing space, but we have found that seedlings and other vigorous green leafy vegetable plants do much better with 75 watts or more of full spectrum light per foot of grow bed. If you add the daylight (full-spectrum) LED or CFL Bulbs to your hydroponic setup, you will notice the green growth of your plants will become stronger and more filled out, than if you rely strictly on Grow Light tray units.

Clamp lights are an easy and cheap way to increase the daylight spectrum for your grow beds as these fixtures are easy to attach to surrounding support bars and bins. Since LED and CFL bulbs can be placed close to the plants, any distance between 6 to 18 inches will provide the necessary lighting without burning the leaves of your plants.

Setting your lights on a timer to allow for 12 to 14 hours of light per day will ensure your plants are able to rest when needed and your light bulbs will not burn out as quickly. This is especially important if you are running your hydroponic setup with small LED grow light strips to supplement your lights as these grow light strips tend to run hot.

While most plants need to rest with a few hours of darkness per day, most lettuce plants are able to produce 24 hours per day and will mature quicker with longer light settings. While 12 to 14 hours of light is a good setting for most of your vegetable plants, it may be necessary to research the light requirements of some exotic plants. Remember that the length of light, heat and color spectrum most predominant in your setup will impact the flowering and fruiting aspect of your plants, so research may be necessary if you are trying to produce flowers or fruit on your crop.



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3. **GROW AT THE PROPER TEMPERATURE RANGE:** There are two types of vegetables: Cool Season Crops and Warm Season Crops. Cool Season vegetables prefer temperatures between 55°F and 75°F while Warm Season vegetables prefer temperatures between 65°F and 95°F. Cool Season vegetables will germinate in temperatures as low as 40°F with optimal temperatures for germination around 70°F, while Warm Season vegetables will not germinate in temperatures below 65°F. Daytime temperatures also affect the flowering and fruiting of your warm season crops, so keep that in mind when you are starting your warm season crops indoors.



### LIST OF COOL SEASON CROPS:

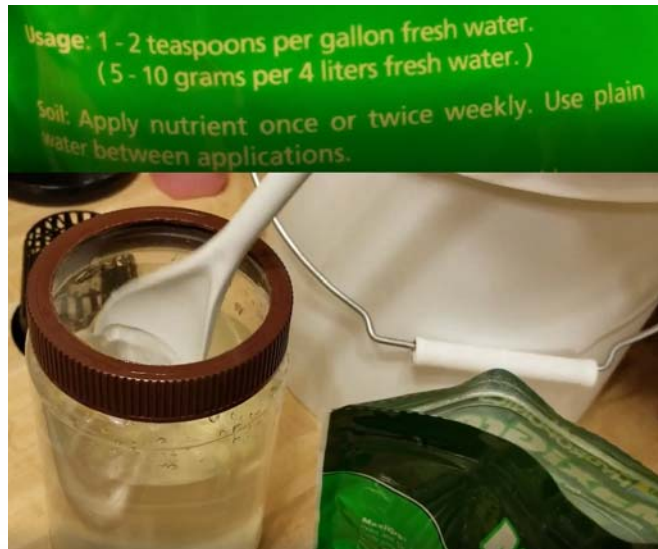
- Most Leafy Greens: Lettuce, Spinach, Swiss Chard, Chinese Greens, Cabbage, Mache, and Kale
- Root Crops: Onions, Leeks, Scallion, Green Onions, Beets, Radish, Turnips, Carrots, and Kohlrabi
- Broccoli, Cauliflower, Peas,

### LIST OF WARM SEASON CROPS:

- Beans, Tomatoes, Potatoes, Corn, Mustard, Celery and Herbs
- Melons, Squash, Zucchini, Cucumbers, Eggplant, Peppers and Pumpkins

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- MIX THE CORRECT NUTRIENTS FOR YOUR PLANTS:** If you do not have a good hydroponic micro-nutrient for supporting your seedlings and small plants, a complete hydroponic mix for green growth that can be used as a base for seedlings and green leafy plants is General Hydroponics Maxi Grow Nutrient at 1 tsp per gallon of water for small or young plants and 2 tsp for larger plants. This nutrient is complete in itself to grow Green leafy vegetables and for flowering / fruiting plants all you need to do is add General Hydroponics Maxi Bloom Nutrient to your mix when your plants are fully grown.



If you utilize specialized hydroponic formulas for specific crops, you may need to support the green growth of your seedlings and vegetables by adding a Calcium Nitrate supplement to these specialized formulas that are designed for higher fruit growth in your plants. Formulas like Masterblend's Tomato 4-18-38 Hydroponic Nutrients are designed with a lower nitrate content to support the flowering and fruiting stage of full-grown Tomatoes. Since seedlings and small plants require higher nitrate and calcium content when they are developing their foliage, it is necessary to add a Calcium Nitrate supplement 15.5-0-0 to prevent the leaves of baby tomatoes from yellowing during development.

One way to tell if you need to add a Calcium Nitrate supplement to your micronutrients is to examine the numbers in your hydroponic formula. These numbers, known as NPK, stand for Nitrogen, Phosphorus, and Potassium. When you look at formulas like Masterblend's Tomato 4-18-38 formula and you see a low Nitrate Calcium count (4) in comparison to the other values in the formula, you know you will need to add Nitrate Calcium to your baby plants. In the case of this Nitrate formula value of 4, when you add the Calcium Nitrate supplement of 15, you now have a Nitrate value of 20 converting the formula from 4-18-38 to 20-18-38 which is perfect for baby tomato plants.

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- 5. MATCH YOUR PLANTS TO THE PROPER GROW MEDIUM AND HYDROPONIC GROW SYSTEM:** Most small Hydroponic vegetables can be started in rockwool cubes, submersed in a 2 or 3 inch Netpots with Hydroton (clay pellets) holding the Rockwool cubes in place. These netpots can be placed in Kratky (Floating Raft System), DWC (Deep Water Culture), Ebb and Flow Hydroponic Grow Systems, NFT (Nutrient Film Technique) and Aeroponic Systems. Other acceptable grow mediums that can be used in Hydroponics are coconut coir (coco peat), made from the coconut husks, perlite, a hard porous material made from volcanic glass, and vermiculite, a soft, spongy material made from super-heating mica.



While most small green leafy vegetables can grow in nearly any hydroponic system, certain plants produce better in one system over another. To determine what system will work best for you and your plants, it is important to know something about the various systems available as follows:

**Kratky (Floating Raft System):** This system suspends the roots of the plants directly into a nutrient reserve without an airstone inside the reserve bucket. This system is most suitable for small leafy vegetables that can rely strictly upon the air space between the bottom of the net pot and the water reserve to provide the necessary air for the roots. Since this system does not need to be connected to an air pump, it is more portable and can fit in compact places like windowsills (like the jar lettuce grow system above), shelving units and aquaponic floating raft systems.

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**DWC (Deep Water Culture):** This system suspends the roots of the plants directly into the nutrient reserve with an airstone or aeration grid inside the reserve bucket connected to an air pump outside the reserve providing the oxygen needed for effective root growth. This system is suitable for small and large vegetable plants alike and is specifically effective with large root plants like tomatoes that can fill the reserve of a 5 gallon bucket without additional grow media needed to maintain proper hydration for the roots.



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**Ebb and Flow Hydroponic Grow Systems:** Grow beds that are filled with grow mediums like Hydroton clay pellets, coco coir, perlite or vermiculite are often fed by an ebb and flow system in which the nutrient water flows into the trays soaking the roots of the plants and grow media and then drains out of the tray back into the reserve bucket. Often these units are setup with a timer to ensure water doesn't overflow the trays in the process of draining and out of the units. Root crops like carrots, beets and potatoes often do best in an ebb and flow system.

**NFT (Nutrient Film Technique):** This system is similar to Ebb and Flow Hydroponics in that it relies upon a submersible water pump put into the nutrient reserve bucket used to pump water into the nutrient grow trays that are built with a thin cloth film to hydrate the roots of the plants or a water track within the bed that ensures the roots of the plants are suspended in a small track of water while being somewhat exposed to the air around the roots. This system is often utilized in aquaponics where a continuous flow of water runs through large PVC pipes grow beds prior to returning to the fish tanks which serve as a nutrient water reserve. This type of system is perfect for plants, like strawberries, that are prone to root rot because the roots are mostly exposed to air inside the PVC pipes or NFT trays while the continuous flow of water inside the grow system ensures the roots are properly nourished and never completely dry out.

**Aeroponic Systems:** Unlike standard hydroponics that utilize nutrient water flowing over the roots of the plants, aeroponic plants receive their nutrients from a mist that is sprayed onto their roots several times an hour. This system has the advantage of lower water usage in many cases and potentially higher growth rates with certain plants that thrive on higher oxygen to water ratios.