

MIXING NUTRIENTS & ADDITIVES

- See **Feed Charts** for in-depth root and foliar feed dilution rates. Dutch Master® converts EC to ppm using the x0.50 calculation. See article **PPM vs EC** in the growers guide.
- Shake before use. Never mix undiluted nutrients or additives together as precipitation (fallout) will occur rendering some nutritive elements unavailable to plants potentially creating deficiencies. Reduce Cal-Mag® by 1mL per gal/4L for every 200ppm/0.4EC found in hard well or tap water. Dutch Master recommends using filtered water, preferably RO.
- Add products separately to water while stirring, beginning with Sila-Guard®, then Cal-Mag®, followed separately by Micro, Grow, Bloom, Trich-XL®, Zone® then Saturator® last until you reach desired EC/ppm - preferably measuring with a calibrated TDS meter. If you don't have a TDS meter, be sure to follow our **Feed Chart** recommended dilution rates beginning with the standard feed chart before progressing confidently to the aggressive feed chart.
- To increase nutrient EC/ppm strength, increase dosage volume of Micro, Grow and Bloom maintaining recommended dilution ratios. To decrease nutrient EC/ppm strength, dilute made up nutrient solution by adding more water. Finally, check pH and adjust accordingly.
- Dutch Master® recommends maintaining nutrient feed solution pH for Aqua Feed® and Media Feed® between 5.5-6.1 and Coir Feed® between 5.6-6.2 using Commercial Edition® pH Up or pH Down. When making a fresh nutrient solution, adjust the pH to the low pH point recommended for your nutrient above, as pH may rise over time. If the pH of your nutrient solution approaches the high pH point above, and it's not time to drain and refresh the entire nutrient solution in the system, slowly add a little Dutch Master® Commercial Edition® pH Down while stirring and checking with a calibrated pH meter or pH indicator strips to achieve the low pH point again. Remember, adding pH Down is also adding phosphorus, while adding pH Up is also adding potassium so be diligent with its use. If the pH of your made up nutrient solution shifts drastically in a short period, it is usually a sign that the plant is stressing. Check for root rot etc.
- Reduce nutrient strength by 20-25% for Aqua Feed® and 25-30% for Coir Feed® and Media Feed® when growing in excessively hot or humid rooms/climates or if plants show signs of stress (leaf tip/edge burn, root rot, insects attack, etc).

GROW SYSTEM INSTRUCTIONS

- **Top feed drain to waste systems:** Monitor nutrient solution runoff pH/EC/ppm and flush root zones if runoff EC/ppm increases above the EC/ppm of the nutrient solution being fed, using the following regime from the **Feed Chart**: Established Cut/Seedling phase if in vegetative stage or 7 Days Pre-flush phase if in flower stage. If possible, try establish a feed program that minimizes excessive nutrient build-up in the media, therefore, feed plants as per the feed chart recommendations but also include a weekly single flush-feed as above, Established Cut/Seedling if in vegetative or 7 Days Pre-flush if in flower, then repeat full strength feed cycles again, and so on. Pot size and type (plastic vs fabric) will also dictate frequency of feeding - smaller 3-5 gallon (10-20 liter) pots will likely require daily feeds as opposed to 7-10 gallon (30-40 liter) pots feeding every 2-3 days (fabric pots require more frequent feeding than plastic due to greater evaporation however, also provide more air/oxygen to the roots with less chance of over-watering and root rot). Aim for 10%-20% (when using pure water) or 15%-25% (when using tap water) of nutrient solution runoff/waste when feeding as this will help maintain a balanced elemental ratio in the media and deter damaging salt buildup. A great way to more accurately check the pH/EC/ppm of the media (coir, soil, soilless, etc.) is dig out 3 or 4 tablespoons right below the main cannabis trunk and put into a glass along with approx 1 cup of pure demineralized or RO water. Stir, let sit for 10 mins, then measure pH and EC/ppm with calibrated meters.
- **Recirculating Systems:** Drain grow system/refresh nutrient solution reservoir every 7-14 days to avoid unbalanced elemental ratios within the nutrient solution, (plants also excrete exudates from the roots, some of which may cause drastic pH swings and can also support the rapid growth of root rot). Measure nutrient solution pH/EC/ppm regularly and top up the system reservoir with a pH adjusted 1/3 strength nutrient solution between system change-outs to maintain the correct pH/EC/ppm solution levels.

ROOT ZONE & PRE-HARVEST FLUSHING

- Flushing root zone media (coco coir, soil, soilless, rockwool, growstones, etc.) every 1-2 weeks throughout flowering using the 7 Days Pre-flush phase on the **Feed Chart** is highly recommended as these media tend to bind up nutrients as the media compacts over time. Pre-harvest final flush times may vary depending on plant genetics or media used or systems grown in. Typically, water culture systems (DWC, NFT, aeroponics) require much less final flush time (2-5 days) vs coco coir, soil, soilless, rockwool (4-10 days). Leaf color-fade to light green/yellow will determine harvest time readiness. Flush well-established mother plant media every 1-2 weeks using the Established Cut/Seedling phase on the **Feed Chart**.

MEDIA CONDITIONING/BUFFERING

- Rockwool cubes/slabs/media should be conditioned/buffered prior to use by soaking in water with the pH adjusted to 5.0 for a few hours, then drain water well (do not squeeze excessively) and re-soak rockwool using the Cube Soak phase on the **Feed Chart** adjusting pH to 5.5. Then drain rockwool slightly prior to planting out.
- Coco Coir should be initially rinsed with water then conditioned prior to use by soaking well for at least a few hours with Commercial Edition® Cal-Mag® @ 15mL per gallon of water with the pH adjusted to 5.6, then drain coir thoroughly prior to planting out. This will set the correct pH level and balance the calcium, magnesium and potassium levels within the coir.

ADVANCED GROW ROOM TIPS

- Mother plants should be fed using the vegetative phase on the **Feed Chart** based on the plants growth stage. Do not use the flower phase. See mother plant flushing instructions above.
- It's best to allow nutrient solution in the feed tank to reach ambient/room temperature prior to feeding plants to avoid root shock. Maintain well-aerated nutrient solution temperatures between (Media Feed® and Coir Feed®: 64-73F/17-23C) and (Aqua Feed®: 64-70F/17-21C) for optimal dissolved oxygen and reduced pathogen (root rot) colonization. Thermostatically controlled, submersible aquarium water heaters are cheap and effective in colder climates. Water/nutrient chillers are effective in warmer climates.
- Keep nutrient solution super-aerated using air pumps and air stones to maximize dissolved oxygen levels, avoid root zone issues (pathogen/root rot attacks) and promote plant health and vigor. Dutch Master recommends the use of pure water for premium results. Reverse osmosis filtration is cheap and effective at producing pure water.
- Maintain temperatures with lights on for seedlings and vegetative plants between 22-30C/72-85F and flowering plants between 20-26C/68-79F. Lights-off/dark room temperature should not drop more than ~8C/15F from lights on.
- Maintain the following humidity levels for optimal cannabis growth: Cuttings 80-90%, seedlings and vegetative plants 50-70%, flowering plants 40-50%. Humidifiers/dehumidifiers are cheap and effective at increasing/reducing room humidity. Air Conditioners provide effective room cooling/heating and dehumidifying.

FOLIAR SPRAYING & INCREASED YIELDS

- The addition of carbon dioxide supplementation to the grow room by CO₂ injection or gas burners can greatly increase crop yields (30%+). Typically, plants can endure warmer temperatures and will likely require more regular and stronger nutrient feeds.
- Foliar spray the top and underneath of leaves weekly with a combination of Sila-Guard®, Cal-Mag®, Trich-XL® and Saturator® mixed in water (never mix undiluted), pH adjusted to ~6.0-7.0, as per the foliar **Feed Chart** dilution rates, from cutting, all through the vegetative stage and up to bud-set (about 14 days into flowering), preferably when lights first come on, avoiding excessive heat and direct air flow on plants (turn off fans to allow spray to sit on leaves longer). Spraying leaves until slight runoff occurs at the beginning of the lights-on cycle allows plants to maximize photosynthetic response to the foliar application resulting in faster, healthier growth!
- **WARNING:** Avoid spraying light bulbs or electrical equipment. For the longest product shelf life, store nutrients and additives with a sealed cap in a cool, dark, dry area.