

Why Run Drain to Waste?

“Drain to waste” provides more control over your plants and helps to prevent diseases

A very common concern is that the system will waste too much nutrient due to the excessive amount of “waste run-off.” This is simply not the case. A dialed in “Drain to Waste” system will only waste 10-15% of the fed nutrient solution as “run-off.” an example of this is as follows: A given garden uses 5 Gallons of water to feed all the plants within, the “waste run-off” will only be 1/2 to 3/4 of one gallon of solution. If using “Drain to Waste” with Coco, Soil or Rockwool, the frequency of watering is down to a minimum (usually once a day or once every other day.) “Ok”, you might say, “but, what are the benefits?” “Why should I run “Drain to Waste?”

The 3 principal reasons to run “Drain to Waste” are as follows:

1. Less chance of Getting Root Rot

Most common Root Rot issues spawn from pathogens that produce spores as a way of spreading their colonies and infecting further plants. The disease starts in one (usually the weakest) plant in the garden, and uses this plant as a factory to produce more spores (in an attempt to infect more plants with larger stronger colonies.) In a recirculating system, the spores generated from this one plant then drain out of the plant and collect into the main reservoir where they mass produce with the water supply and then infect all the plants in the garden on the next and successive waterings. With “Drain to Waste” this cannot happen because any water leaving a given plant goes to a drain and not back to the “Main Reservoir” Therefore no spores can infect a reservoir.

2. Always feeding FRESH nutrient rich solution to your plants

In a “Drain to Waste” reservoir the nutrient rich solution feeds the plants and the “run-off” gets drained out the bottom of the plants and runs to waste. This ensures that plants get fed only FRESH non-recirculated nutrient every time. The difference between “Drain to Waste” and “Recirculating” reservoirs is as follows: In a recirculating reservoir the nutrient solution starts out complete as per the original recipe contained in the bottles. As the waterings / feedings continue and the plants feed off of the nutrient solution for the course of the week the solution loses key minerals to the plants unique feeding needs. This also causes precipitates to form as certain minerals (now in new molecular arrangements) “lock up” and fall out of solution. Now the original recipe is no longer intact. With “Drain to Waste” this is not the case. The recipe stays intact and the plants always get the complete line of food requirements every time. This provides for healthier, stronger, and faster growth.

3. **The ability to do Flushes and Drenches**

Flushes are very important in a coco-based or rockwool-based medium. Flushes allow for the resetting of the medium as well as a drawing out of un-wanted nutrients from within the plants themselves. Flushes can be very instrumental for good healthy plant growth. Under normal conditions (recirculating system) a flush will pull the salts out of the medium as well as the plant, draw them into the reservoir, and then keep pumping them back into the plants again and again, until the reservoir is drained and the cycle is repeated a few times. With “Drain to Waste” this is not necessary. We can run a flush “to waste.” All salts and excess minerals are drained from the plants and truly flushed away.

Drenches are also another nice feature of “Drain to Waste” systems. For example, products like Gnatrol were made to be used in a soil based system and not designed for a recirculating hydroponics system. With a drench, one can load the Reservoir up with any given product and run it once or twice through the system and then either Flush or change out the reservoir and re-up the regular

nutrient regimen and feed as normal. There are many products that are made for a drench application. Alternatively one can Drench by pouring over the tops of the plants - then flush. Call with questions on drenching - Please.

Other reasons why Drain to waste is a better overall system choice:

1. pH doesn't fluctuate as much
2. System itself stays cleaner
3. Most Large Agricultural Business use Drain to Waste

How and Why to do a Proper Flush

Why Bother Flushing?

Flushing is an integral part of growing healthy happy plants. Flushing a system and plants will remove any excess salts that have built up over time. Flushing will also help restore an even CEC (Cation Exchange Capability) balance to a medium. Most mediums hold on to salts and release them back into the root zone over time, or attract more salts to the salts that have already begun to form, promoting an ever downward spiral towards "nutrient lockout." Put another way, the more salts in a medium to begin with, the greater the potentiality of attracting ever-more salts until eventually the plants can no longer pull any water (or nutrients for that matter) up at all. Lock out can easily be avoided by flushing from time to time. Some mediums need flushing more than others.

How do I Flush?

Flushing is fairly easy to do. First drain your Reservoir and then refill with FRESH Reverse Osmosis (or purified) water. Add a flushing agent like **Clearex** and / or pH the

solution (always pH - never forget to pH - always pH last - right before watering your plants.) Run at least 3 times your normal watering amount through the plants. Example: if your plants normally take up 3 gallons of water in a watering make sure to flush 9 Gallons of water through them. (If running a recirculating system, make sure to run for at least 2 waterings.) Then drain the reservoir and re-up the nutrient solution as normal. You can either wait to feed until the next scheduled time or feed them right away .

Checking the Run-Off can be a very useful tool to dialing in your Grow Medium

By testing the runoff that is coming out of your drain before it hits the reservoir (after a Flush has been running) one can tell what the pH and TDS (ppms) of the medium is resting at. Ideally, whatever the water is going in should measure the same as the water coming out. An example would be as follows: fresh water flush solution “going in” has a pH of 6.0 and a TDS of 0-50ppms (R.O. / Purified Water.) The pH of the drain water coming out should be 5.8- 6.2 (0.2pH slide in either direction). The TDS of the drain water coming out should be within 50-100ppms (50ppms off from the fresh flush water coming in).

Now for the Fun Part - Adjusting the pH and/or ppms to equal the Water Coming in:

If the ppms of the water coming out the drain are higher by more than 50ppms of the water coming in from the reservoir (Ex. 50ppms going in, 100ppms comin out) then continue to Flush until the ppms are down to their appropriate level. If the pH of the Flush solution going in and pH coming out (of the run-off being collected at the drain) match (at 6.0 as per our example) then we are sitting pretty. If the pH does not match the pH of the solution going out (through) the drain than we need to play with the solution going in until the pH coming out matches. Back to our example: The pH going in is 6.0, lets say the pH coming out is 7.0; then the medium must be around 8.0. If for example the pH is 6.0 going in, and the pH coming out is 5.5, then the medium is

around 5.0. So, in order to correct the pH in the first example (pH going in is 6.0 and pH coming out is 7.0), one would need to lower the pH of the solution going into the system to say 5.0 or even 4.5 and run a good amount of water into the medium and test the run off until the water coming out is the pH we would want it to be (in this example it would match the original water going in at 6.0). Once the pH of the water coming out (down the drain) matches the water solution coming in, one final test is necessary. Flush again with the water going in (in our example 6.0 pH) and make sure it lines up and is equal to the pH of the water coming out.) This last step is necessary because the water coming out is not necessarily where the actual medium is at. Once the pH of the water coming in matches the pH of the water coming out, you are done and the medium is “set”.

Different Mediums and their Flushing Requirements

Rockwool - Flush every other week. Holds salts with a low CEC. Fairly easy to adjust pH of medium. **Coco (Coir Fibre) or Soiless Mixes with Coco** - Ideally Flush every week (can Flush every other week). Make sure to Flush with 300ppms (150ppms of **MagiCal** + 150ppms of Nutrient Solution). Low to Medium - Low CEC. Sometimes has a Buffer (think in terms of armor or shielding) that needs to be broken through before pH will adjust. (Flushing can be long and arduous at first, until Buffer is “broken”.) **Hydrocorn** - Flushing medium once a Month is enough. Virtually no CEC. Super easy to adjust pH of medium. **Soil** - Varies on the soil. Usually, the method of Feed, Feed, and then Flush is applied for soil growers. This breaks down to once a week flushing (because most soils as the plants start growing faster and faster need water every other day). Soil has a Medium to High CEC. Sometimes has a Buffer which needs to be “broken before pH can be adjusted.