

Coco Hydroponics

Coco coir (coir fibre, Coir, Coco, Coco fibre) is a product derived from the husks of coconuts. Visually it looks a lot like peat. Coco, when used properly, represents the best of soil and hydro in a single media. Coco can be extremely forgiving, and growth tends to be very consistent. Coco is pretty damn tolerant of over-and-under-watering. As you will see below Coco has many amazing properties (and some minor obstacles) making it an ideal medium to grow plants in.

Coco is almost a neutral medium, which means that aside from its limited ability to adjust pH to optimum levels, it does not bind nutrients and feed them slowly to the plant over time like traditional “soils” do. (This means that Coco has a relatively low cation exchange capacity (CEC) compared to most “soils”. All the nutrients your plant needs to grow must be provided by you. Coco fiber does, however, create millions of tiny air spaces, which are great for the roots. This is due to the large surface area of the coir particles. Think of coco as a very porous, open cell sponge; it releases water very quickly and as it drains out of the bottom of the containers, it pulls in fresh nutrients and oxygen. The medium holds water, oxygen, and nutrients in a perfect ratio for the roots in these tiny spaces. As oxygen plays an all-important role in respiration (roots pumping nutrient up to the plant), the structure of coco coir further promotes root and plant health. This factor should not be underestimated because healthy roots invariably lead to a healthy plant (and a healthy yield).

Coco also has a remarkable capacity to insulate and protect the plant’s root system in hot weather. This means that coco coir isn’t as prone to overheating, due to excessive ambient air temperatures, as many other mediums, making it ideal for warm climates. Because the root zone is cooler, there is more oxygen available for the roots to use.

Watering with coco is different than with soil. If you grow in soil, it can be much easier to “drown” the plant with too much water. Coco on the other hand is so light that there will

always be more oxygen left and the plant will have a much harder time being oxygen straved. You can let the pot become dryer the first week only to stimulate root development. We suggest watering your medium until fully saturated (with at least 10% "run-off") and then letting your plants go from wet to "barely moist". Coco can be used differently than this - allowing for multiple waterings a day. A grower must only let Coco go from Wet and Fully Saturated to "Moist" (usually a few hours when the lights are on) before watering again. We have had consistenly great results off of the former method - Going from Wet - to "Barely moist".

Although Coco, has a very good water - to - air ratio (even trumps Rockwool which also claims to have a 70% water - 30% air holding capacity); however coco offers the unique ability of being cut with a further aerating substance like Perlite. Adding perlite can increase your overall oxygen levels within the root zone immensely. We suggest one 1 cu. ft. bag of Perlite to one bag of 50 Liter **California Substrate Coco**. This will give you roughly a 60% Coco / 40% Perlite mix, which has ideal aeration levels as well as maintaining an adequate water - holding capacity.

Coir holds a considerable amount of water within. It also evenly distributes the water throughout the medium. This is great for growers using drip systems becuae you only need one to two drippers to create full saturation throughout the entire container. However, since Coco holds onto water and nutrient within its structure it creates a pH Buffer within the medium itself. Coco also has a natural tendency (because of its high levels of Potassium contained within) to hold onto to certain salts. This tendency (which contributes to its mid to low CEC value) tends to make Coco's buffer rather difficult to bust, thus making it harder to change the pH of the medium. Do not fret though because the Buffer CAN be broken. It just takes flushing copious amount of pH corrected 300 ppm nutrient solution (50% of which should be Cal/Mag) with Final Phase (Flushing agent mixed in) through the medium before you even start to grow in it. In this way you can ensure that the pH of the solution going into the medium and the pH of the solution coming out of the solutiion match. (An example of this would be 6.0 pH going into the medium and 6.0 pH coming out as "run-off". This is a VERY IMPORTANT concept to

grasp when using Coco - based mediums. We have made an “info sheet” that deals with this entitled How to do a Proper Flush.

Another issue (touched on above) a grower should be aware of when using Coco - based mediums is that Coco naturally has a good amount of Potassium in it which when released into the medium competes with some nutrients (such as Calcium, Magnesium, Manganese, and Sulfur), therefore we will want to FLUSH the medium on a regular (weekly or bi-weekly) basis or water with very low ppms / EC values. When Flushing make sure to Flush with 300 ppms of solution made up of Cal/Mag + Nutrient. When Flushing, we also suggest collecting and testing the “run-off” to make sure that the ppms have gone down to almost nothing, and that your pH coming out of the bottom of the containers matches the pH being fed to the plants.

Again, this is properly covered in the “info sheet” entitled How to do a Proper Flush. (Subsequently, If you Flush regularly we have found that you can feed your plants as High ppms as any other medium we have used).

Coco is most suited to a run-to-waste system. A “runoff” of 10-20% of the volume watered each watering is the most common recommendation to avoid the possibility of salt buildup in the coco media. Drainage helps control ppms / EC and pH levels, and flushes unnecessary salts out of the media. Since not all plants use similar amounts of nutrient, and they also secrete salts, any surplus of nutrient makes the coco brackish and changes the pH. By means of drainage you flush the media every time you give nutrient, which prevents it from becoming brackish. This fdoes NOT mean that you should Not FLUSH as indicated above, but by regularly testing the run-off you can do less Flushes. Many seasoned Coco growers will only Flush once every 3 weeks.

On a less positive note, coir can also contain high levels of sodium (salt). If you're growing in coir be aware that this can be a potential problem. We suggest you only use High - Grade Coco Mediums like California Substrate. California Substrate is unique in their all natural “chemical” based Flush which brings the overall ppms / EC levels

contained within the medium down to next to nothing. California Substrate also has a great consistency of long to short fibres, and is pre-innoculated with their proprietary Trichoderma strain of beneficial Fungi to help ward off pathogens and help with the initial transplanting process.

Finally, Coir has two other very important benefits that make it excellent for plant growth. It has naturally occurring enzymes which help ease the roots, and allow for some general stress relief and ease of new growth. It is also an amazing home for beneficial microbes of all kinds. It is organic, and as stated above, very porous, providing the needed aeration for aerobic microbes to colonize and thrive. Anyone who has grown in Coco, used microbes, and looked at their root zone when they were finished can attest to this. Roots are firm and fluffy. Usually with huge ropey swirls filling up the entire container (it's hard to even see the coco by the end cause the entire container is filled with roots) with smaller tendrils coming off the larger coils, and if done correctly, fuzzy micro-hairs throughout!

When planting into Coco we suggest the following 3 protocol:

1. Flush the Medium with Final Phase + 300ppm Nutrient Solution (made up 150ppms of CalMag/ Solution (Like MagiCal) and 150ppms of Nutrient) 6.0 pH water.
2. pH the Medium to 6.0 pH. (Make sure you run enough Solution (listed above) at 6.0 through medium!)
3. After the medium has the correct pH - Add 500ppms of Nutrient to "charge" the medium before planting within it. Once it is pre-charged and pH corrected plant into the medium.

3 Potential Problems when using Coco to be aware of:

(As long as you are aware of these potential issues than you can easily avoid them)

1. Coco holds salts and must be Flushed with 300ppm solution (made up of 150ppms CalMag + 150ppms Nutrient. The Run-off should be tested to see what ppms/EC and pH levels are.
2. Can create a pH buffer (at the wrong pH level within the medium) which must be “broken” and re-set to the proper pH level for optimal growth. 6.0 in Vegetative Stage / 5.6-5.8 in the Fruit / Flowering Stage.
3. Coco can still be over-watered (never mind what you have heard). Even if over-watered your plants will still survive. They just will not be happy. So, make sure to let the medium dry out a bit before re-watering!

Procedures to Follow when Using Coco-based Mediums

1. FLUSH the medium on a routine basis. Every 1-2 weeks is what we suggest.
2. Check the “Run-Off” for proper pH level and (when Flushing) for a low ppm / EC value.
3. pH the Medium to 6.0 pH to start with in Vegetative Stage. Drop down to 5.6 - 5.8 in Fruit / Flowering Stage.
4. Do NOT over-water the medium. make sure that it at least goes from “Wet” to “Moist” if not all the way to “Barely Moist” before watering the medium again. In general, this should be about one time a day or even once every otherday in the vegetative phase and then one to two times daily in the Bloom phase depending on container size, and environmental (temp, humidity, and CO2 levels).
5. We highly suggest using a digestive enzyme solution to help break down dead or dying root mass (such as Cannazyme).
6. We also highly suggest using Beneficial Microbes in Coco. (Some suggestions: Mykos and Vermi - T. Alternatively you could use Great White and Heavy Roots.