COCO Infopaper

Everything you ever wanted to know about CANNA COCO

CANNA
The solution for growth and bloom

History

Coco peat is the leftover material after the fibers have been removed from the outermost shell (bolster) of the coconut. It took 10 centuries to make this waste the medium of the future. The first description of the coco process dates from the 11th century and was recorded by Arabian traders. In 1290, Marco Polo described the process of extracting fibers from coconuts. For centuries, this process went unchanged. Coco peat was a waste product from factories that used coco fiber as a raw material for making sailing ropes, chair seats and mattress fillings.

In 1862, John Lindeley, botanist, gardener and secretary of the Royal Horticultural Society, introduced coco peat as a growing medium to English horticulture. After successful experiments in the gardens of the Society, complications appeared due to harmful substances naturally present in the material and the fact that knowledge regarding the application was still in its infancy. Ultimately its quality caused too many problems for various crops in such a way that the use of coco declined in agriculture. It took another 100 years before coco was rediscovered as a potential growing medium. New techniques and analysis methods meant coco could be turned into a valuable growing medium. From this moment it became possible to grow many crops successfully on coco.

CANNA, a notorious pioneer, was impressed by the potentials of this product. After many years of research, CANNA successfully created a new medium complete with a special COCO nutrient solution. During its launch, CANNA was the first company to introduce RHP certified COCO to the market.

Environmentally friendly & professional!

COCO is a 100% natural grow and flowering medium, which has proven its value across years and years. CANNA, the COCO pioneer from Holland, has played an important role in the current status of COCO in horticulture. COCO is not only a high quality product, but also an honest and environmentally friendly product.
For many years the raw material was considered waste material, and enormously useless "COCO Mountains" appeared in the landscapes of countries like Sri Lanka and India. By developing a special biological composting process this "waste" was transformed into a high quality product. This innovation was, and still is, an important contributor to the local economy of India and Sri Lanka.

This and the unique growth characteristics ensure CANNA COCO is the medium of the moment and the future!

Higher yields! 6 to 10%

Besides water, air is essential for the plant's roots system. Research across various medium types shows that more air leads to quicker and more intensive rooting, 6-10% higher yields and lower fertilizer use. Quicker and more intensive rooting means better root function in taking up water and nutrients, keeping up with the plants requirements. A way of achieving a higher air level in your substrate is to drip irrigate less often. More water is taken up from the substrate, the root system develops stronger, and moisture saturation occurs less often. The tests revealed that drip irrigating only once a day meant that 3% more air was present in the substrate. You drip less with CANNA COCO.

The rise of COCO in hydroponics

After its introduction to rose cultivation in 1986, it became clear that coco could be an ideal growing medium for root development, resulting in stronger crops. Unfortunately, the success with roses could not be repeated with all crops. The quality on the coco material was not constant and there was an enormous lack of coco cultivation knowledge.

In 1993 the need for alternatives for peat moss and other media, like rockwool, increased, CANNA started their first experiments with coco. This did not directly result in a marketable product, the insights of "specialists" appeared to be conflicting and there was no answer to practical coco cultivation problems. To determine the coco potentials in an objective way, the only option for CANNA was to do the pioneering work itself. Two years later, CANNA launched "CANNA COCO and this initiated the first COCO product on the consumer market (Germany, 1996).

After a successful introduction of COCO to the German market, CANNA COCO was launched in the Netherlands in 1997. After the results had been published, the rise of COCO was unstoppable and the market share in the horticultural sector increased tremendously. At the end of 2000, almost 35% of the rose acreage and 40% of the strawberry acreage in the Netherlands was cultivated on COCO substrate.

We can confirm that COCO has acquired a definitive place among the other mediums. CANNA sees a growth pattern of 15 % per annum till 2015 for the total COCO market. We believe that for an increased number of potting soil mixtures, the characteristics of COCO are favorable due to the ease of rooting, the large water-retaining capacity in combination with a good drainage, and the high stability of the material.

The plants 'burst' out of the coco

A skilled soil gardener about his experiences with COCO: "The strawberries are much thicker and heavier than I'm used to. And they are not swollen and watery, but really juicy. As it looks now, I'm expecting a higher yield than I ever had. I just grew the plants for a week as I did with soil and they literally 'burst' out of the COCO. The roots grow like weeds and the plants themselves fill the area much faster than normal. My plants have never looked so healthy. The best thing is that you can't make a mistake with COCO."

Switzerland grows at high level

At the end of the nineties, the former Grow Center growshop in Schlieren (close to Zürich) was one of the first to show interest in CANNA COCO at the time of its introduction. Patrick and Jörg, two employees from the very beginning of the store, took over the business and continued under the name Growhaus. Since the launch of CANNA's COCO substrate, they have entirely changed their minds about this tropical fiber.

Until recently, the cellar of the business contained a trial set-up, which was used to compare various popular mediums with each other. After intensive tests, Patrick and Jörg confirmed that CANNA COCO was the most efficient medium. "CANNA is our favorite supplier", said Patrick frankly. This professional, who won his spurs at the legendary Gärtnerei in Enetbrugg, praises the consistently high quality of CANNA's product range. "But especially the ease-of-use makes CANNA COCO superior over other media. Cut the slabs, soak for an hour, and it's ready. Although we have customers using the same slab six times, we set the limit at three harvests", Patrick says with a smile on his face. In addition, the Growhaus team recognizes a higher resistance against soil fungi. Enough reason for successful businessmen 'to push' CANNACOCO and its associated nutrient range to its customers. Depending on the plant species, an average yield increase of 10% is seen as easily achievable with CANNA COCO for the average Growhaus gardener.

COCO measuring method

The most reliable method for measuring the nutrient levels in COCO is using the 1: 1.5 extraction method. EC and pH of the root environment can be determined by using this method. The pHand EC of the drain water generally deviates from the actual root situation, as COCO is able to retain and release elements.

1) Take a sample of COCO from the slabs or pots (photo 1). This can be done with a soil core sampler or a trowel. To get a representative sample the COCO must be collected from as many places as possible.
2) Collect the sample in a bowl and determine whether it contains the right amount of moisture. The COCO has the right amount of moisture if moisture disappears between your fingers when you squeeze it (photo 2). Add de-mineralized water if necessary and mix the COCO.
3) Take a 250 ml measuring jug and fill it with 150 ml of de-mineralized water. Add COCO to the 250 ml mark (photo3). Fully mix and allow the slurry to settle for at least two hours.
4) Mix again and measure the pH
5) Then filter this material and measure the EC.

A 1:1.5 analysis can best be done after 3 to 4 weeks. The target values for EC are between 1.1 and 1.3, for the pH, between 5.5 and 6.2.
Very high EC values increase the risk of burning symptoms. To limit the risk of burning symptoms, the COCO can be rinsed with acidified water containing Coco A/B nutrient at an EC of 0.65 (pH 5.8).

Holland's leading grocer sells vegetables grown on COCO

Hartman BV is the largest market gardener in the Netherlands with a total area of 21 ha. Albert Heijn (parent company - AHOLD) has been their sole customer for 20 years. Willem Hartman grows all the cucumbers, peppers and tomatoes, as well as the exotic vegetables presented on the shelves of the store. After a number of years of testing various natural substrates, Hartman has switched to COCO substrate for virtually his whole company.
"The problems we encountered with thick roots on two hectares of cucumbers have sped up this decision", Hartman says, "Our cucumber plants are even grown in pots made of COCO! The pot is consumed slowly while the roots are growing through".

Apart from a better visual appearance the root development is easier and superior in COCO compared to the development on rockwool. "Due to a healthier root development a better growth is obtained and fewer problems occur. This results in a longer shelf time, as well as a better color and taste", claims Hartman.

His company aims at maximum quality. This is of vital importance since the client only wants the highest quality. The excellent rooting on COCO substrate combined with biological control measures will even raise this quality according to Hartman. The leaves of the pepper plants feel strong and turn slightly upward. "Isn't this what every grower wants", he says.

CANNA COCO easy to use

Because of the high costs of nutrients and the complexity of sophisticated hydroponic systems, more and more growers turn to CANNA COCO for their personal needs. One satisfied customer stated: "Although I've already grown a few harvests, I must honestly say that I still haven't got a clue about growing. With soil everything always went wrong. First, too much water, and then too little. But, that's history since I've been using CANNA COCO. I'm the perfect example that COCO substrate is idiot proof."

Risky quality differences in COCO substrate

In 1998 the popularity of COCO rose enormously causing a shortage of its raw material. As the leading soil and substrate producers could no longer ignore the product, they started to use raw material from new sources without considering the quality aspects. This resulted in huge crop damages especially in France and the Netherlands.

In order to prevent delivery problems in times of high needs CANNA went overseas and made substantial investments in local infrastructure; concrete bunkers were built for controlled storage, mechanization took place and contracts were signed with selected farmers. Advantages: controlled supply and an ideal size (0.5 inch sifting), harvesting without soil contact, and controlled ripening/composting. All this effort results in an insect, seed, weed and disease free product, which was the first one awarded with the RHP standard in the Netherlands.

CANNA RHP Quality mark, above and beyond

The RHP Foundation (Quality Mark for Substrates) is a wellknown concept within the potting mix sector in the Netherlands for controlling substrates and raw materials. The inspection is not limited to the finished product but covers the sourcing and processing of raw materials all the way to the CANNA COCO 50 liter bag. The RHP quality mark has been included in the certification package of ECAS (European Certification body for the Agricultural Sector).
ECAS monitors CANNA's entire production from the factory in India to the end user, to ensure that all requirements for COCO substrate certification are satisfied.

RHP products meet the highest chemical and physical demands and are free from weeds and pathogenic organisms. RHP standard can be met in two ways; either by steam sterilizing the COCO materials or by completely controlling the production process. A disadvantage of a steamsterilized product is its inability to naturally protect crops against harmful moulds, like Pythium. Steaming also converts plant usable Nitrate nitrogen to plant toxic Nitrite nitrogen.

CANNA went the hard way and decided to refrain from steam sterilizing its COCO. This is why, unlike many others, CANNA is able to provide you with COCO product that has the beneficial Trichoderma still in the COCO. Trichoderma is a natural constituent of COCO and is known for its strengthening properties. Our buffering process allows us to 'pre-program' the media to a certain age. This ensures you get the same consistent, high quality material time after time.

RHP

Less growth due to water saturation

CANNA COCO is made up of thousands of capillary micro-sponges that retain almost 1000 % of their own weight in water. Therefore COCO retains an enormous buffer of water and nutrients. It is recommended that the grower keeps the media a bit dry rather than soaking wet. Wet circumstances form an ideal basis for fungal diseases like Pythium. A drier substrate passes more air through to the roots stimulating them to absorb water and nutrients more actively. This results in a faster growth and higher yields.
Another important instrument is timing. Once the COCO has become too wet, reduce or pause watering until the COCO has dried out and then start normal watering again. Check the moisture content of the COCO by hand or by determining its weight by lifting the pot or slab. A rule of thumb for watering fully-grown plants is 4 to 6 liters per m^2 a day. By decreasing the dripping frequency and by increasing the amount of nutrients per watering, the best use is made of available water and nutrients. This will also improve drainage. The frequency of watering depends on the evaporation and the water supply in the COCO. A common rule is; one daily watering is sufficient during the first few weeks under normal circumstances; then increase up to 2 times a day; 2 hours after the lamps have been turned on and 2 hours before they are switched off again. Please keep in mind, smaller root volumes per plant (small pots or many plants per slab) will make COCO dry out quickly. Therefore it is critical to water these plants more often.

Damage

Damage to crop caused by hard water Normally, PK13/14 and CANNA COCO nutrients can be used together. However, in case the tap water is very hard, this combination can cause problems. Very hard water contains high amounts of calcium and the amount of acid necessary to set the pH is relatively high. This is due to a high bicarbonate level in the water. When PK 13/14 is used under such circumstances the risk of precipitation in the water tank increases, and this can cause blocked drippers. If you use very hard water for irrigation it is recommended to use pH – grow (nitric acid) instead of pH – Bloom (Phosphoric acid) to set the pH.

Once you get to know it..

Martin and Gerhardt are two Swiss growers who have been growing since the early nineties. Since they started growing on CANNA COCO products, they never let another medium enter their greenhouses.
Two years ago, when they switched from COCO to COGr they easily produced six harvests a year with little effort.

On top of this, many professional growers tip their hats when they see and taste the harvested results of Martin and Gerhardt. "Personally I think the main advantage of COGr is the possibility to manage three harvests in a row, smoothly.
In the past we used soil, it has almost ruined my back!" COGr boards are light as a feather and stiff, which makes them easy for transport. "It only takes an hour to harvest and plant 250 new plants. Gerhardt cuts out the old plants; I follow him and put new cuttings in the empty holes. No need for carrying new slabs or heavy bags of soil. There is no easier way." Apart from the user-friendliness and cost savings this medium produces a superior, sweet, mouthwatering quality for experts. Thanks to the lightness of COCO the root development is extremely fast. It is striking that plants grown on COGR are better resistant to high temperatures. "Last summer temperatures were as high as 38° C (100 ° F) for many weeks. Still we harvested a perfect crop."

Why does COCO need special nutrients?

Because CANNA COCO is 100% organic it has a high but relative Cation-exchange capacity (CEC). This means the substrate has the ability to hold and retain certain nutrients vigorously thus requiring these nutrients be supplied in a special form that remains available to the plant.
Due to the special Coco characteristics in combination with the unique pre-buffering process, it is possible to combine vegetative and flowering nutrients in one nutrient mix. The media and the plant itself control which nutrients are released to the plant at just the right times. This means the grower doesn't have to worry about the proper point to convert from grow to bloom nutrients!

Why A&B?

CANNA COCO is a two-part nutrient; hence there is an A&B version. This is essential because the concentration and forms of the nutrients supplied interact with each other in the concentrated form. This interaction can cause non-recoverable precipitates and an overall change in those specialized COCO forms of the nutrients.

Hit the Max with COGr!

Besides CANNA COCO, CANNA developed a COCO substrate especially for the more experienced grower: CANNA COGr. CANNA COGr is compressed COCO and consists of a sophisticated mix of COCO fibers, COCO peat and COCO husks. Thanks to the coarse COCO structure, COGr has the unique property of absorbing large amounts of direct available water and nutrients. At the same time the open structure ensures enough air is available for the roots.

COGr is both pressed and dried, which makes transport and storage very comfortable. In order to prepare them for use, they are soaked and buffered with a special solution: COGr buffer Agent. After adding Buffer Agent the boards will increase in volume from 3 to 17 liters.

CANNA has developed 2 special COGR fertilizers, COGr Vega and COGr Flores. COGr Vega and COGr Flores contain all plant essential nutrients (macro and micro) necessary for grow and bloom COGr can be reused up to 3 times without any loss of quality.

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Optimal growing guidelines

The optimum EC and pH of the nutrient solution depends on the plant type, light intensity and climate. The values in the table are therefore indicative of a blank slate. An optimal feeding schedule can be developed for every situation by measuring the pH and EC in the root environment (see COCO measuring method). The pH of CANNA COCO naturally buffers itself to between 5.5 and 6.2, the perfect growing range for the vast majority of all plant species.

CANNA COCO Grow guide

		Cultivation period in weeks	Light / Day in hours	COCO ml/ Gallon	RHIZOTONIC ml/ Gallon	CANNAZYM ml/ Gallon	CANNABOOST ml/ Gallon	PK 13/14 ml/ Gallon	EC + in mS/cm
	VEGETATIVE PHASE								
GROWTH	**Start / rooting (3 - 5 days)** Make substrate wet	<1	18	6-10	15	-	-	-	0.7-1.1
GROWTH	**Vegetative phase I** Plants develop in volume	0-3[1]	18	8-12	8	10	-	-	0.9-1.3
FLOWERING	**Vegetative phase II** - Up to growth stagnation after fructification or appearance of the formation of flowers	2-4[2]	12	10-13	8	10	8[5]	-	1.1-1.5
	GENERATIVE PHASE								
FLOWERING	**Generative Period I** - Flowers or fruits develop in length. Growth in height achieved	2-3	12	12-15	2	10	8-15	-	1.4-1.8
FLOWERING	**Generative period II** - Development of the volume (breadth) of flowers or fruit	1	12	12-15	2	10	8-15	6	1.6-2.0
FLOWERING	**Generative Period III** - Development of the mass (weight) of flowers or fruit	2-3	12	8-12	2	10	8-15	-	1.0-1.4
FLOWERING	**Generative Period IV** - Flowers or fruit ripening process	1-2	10-12[3]	-	-	10-19[4]	8-15	-	0.0

1. This period varies depending on the species and number of plants per m^2. Mother plants remain in this phase until the end (6 – 12 months).
2. The changeover from 18 to 12 hours varies depending on the variety. The rule of thumb is to change after 2 weeks.
3. Reduce hours of light if ripening goes too fast. Watch out for increasing Relative Humidity
4. Double CANNAZYM dosage to 19 ml/gallon, if substrate is reused.
5. 8 ml/gallon standard. Increase to a maximum of 15 ml/gallon for extra flowering power

EC: EC+ value is based in mS/cm when EC water = 0.0 by 25°C, pH 6.0
Add the EC of the tap water that is used to the recommended EC!
The EC total in the example is with tap water with an EC of 0.4

pH: Recommended pH is between 5.5 and 6.2
Adding pH- can increase EC.
Use pH- grow in the vegetative as in the generative phase to lower the pH

PPM: PPM+ value is based on 0.74 conversion factor.

The guidelines in the table aren't an iron law, but can help novice growers to develop a sophisticated fertilization strategy. The optimum fertilization strategy is further determined by factors such as: temperature, humidity, plant species, root volume, moisture percentage in substrate, water dosage strategy, etc.

Make your personal grow schedule at
www.canna-hydroponics.com

Further tips:

- It is not necessary to 'water in' with CANNA COCO in advance of planting. It is recommended to drip the COCO with nutrient solution (2 ml Coco A and 2 ml Coco B /liter; pH 5.5-6.2) until drain appears. The COCO now contains enough nutrients and water for a couple of days. Furthermore the right temperature (20 - 25 °C / 68 – 77 °F) and high air humidity will guaranty an optimal start.
- Do not place too many plants per square meter; plants will generally become larger on CANNA COCO and will need more space than on e.g. rock wool or potting soil.
- Always apply Coco A and Coco B in equal amounts, and mix well before measuring EC / PPM.

CANNA, a source of information
If this leaflet has been of use to you, you may also find the other sources of information interesting: CANNA General Brochure and BIOCANNA General Brochure as well as the CANNA product leaflets for CANNA RHIZOTONIC, CANNAZYM, CANNA PK 13/14 and CANNABOOST.