***Is Coir an Eco-friendly Substitute for Peat Moss?***

***https://www.gardenmyths.com/coir-ecofriendly-substitute-peat-moss/***

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In the search for a peat moss alternative, coir is the one that is most often discussed. Coir is made from the outer husk of coconuts and is a waste product from the coconut industry. Environmentalists are quick to point out that “since it is a waste product it’s use is more environmentally friendly than using peat moss.” How can such common sense logic be wrong?



Shipping coconut husks to a coir processing plant in Vietnam

***What is Coir?***

A coconut consists of two main parts, the inner coconut kernel which we eat, and the outer husk. The outer husk consists of fibers and corky material found between the fibers. The fibers are extracted and used for many applications including [floor mats, doormats, brushes and mattresses](https://en.wikipedia.org/wiki/Coir). The remaining dust and short fibers are known as coir pith.

In horticulture, the term *coir* is used interchangeably with the term *coir pith* and is sometimes called coir peat, coir dust, coir meal or coco peat. The material is brown, sawdust-like and looks similar to dry peat moss. Most of the coir used in horticulture comes from larger coconut fiber processing mills located in Sri Lanka and India.

In some cases the husk is simply broken into chucks without removing the fiber and sold as [potting media for plants like orchids](http://www.gardenfundamentals.com/repotting-orchids/). The exceptional water holding capacity and airiness of the material make it a perfect media for such plants.

Choir has many of the same properties as peat moss including an ability to hold a lot of water. It is sold dry, but after soaking in water it expands 3-4 times in size as it soaks up all the water. Coir tends to have high levels of potassium and low levels of calcium (ref 4). It is not a perfect substitute for peat moss, but for the purpose of this post let’s assume it is good enough to be used as an alternative potting media.

The key question then becomes, is coir more sustainable than peat moss? If it is, we should certainly consider switching to it. If not, we might as well stick with peat moss.

***What is Sustainability?***

There is so much talk these days about products being green, eco-friendly, or environmentally friendly, but what do these terms really mean? I’ll bet most people can’t explain what they mean except in very vague terms such as “it is a product that is better for the environment” or “it is sustainable” – another term that gets thrown around and is rarely understood by the general public – including me. I had to look up the definition. You probably have a sense about their meaning, but can you really define them?

Wikipedia defines environmentally friendly as having “minimal, or no harm on ecosystems or the environment.” By that definition there is not much we humans do or use that would qualify. Clearly neither coir nor peat moss meets this standard. However, in our quest to harm the environment less, we can use this definition to compare two options to see which does less harm to the environment.

Sustainability is “the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance” (ref 2). It measures how much damage something does to the environment and to society – note the word society – it is not just about the environment.

***Our Perception is Easily Confused***

Humans are not good at using logic to compare two options for eco-friendliness and peat moss is a good example.

Coir is a waste product so immediately people assume that using it has very little environmental impact. When I asked people about the environmental impact of shipping the product half way around the world they dismissed this issue and focused solely on the fact that it was a waste product. It is a myth to think that using of a waste product is automatically eco-friendly.

Newspapers and environmental sites flash pictures of the raped peat bogs in Canada as evidence against peat moss. These are strong images and people respond deeply to them. Add to that the fact that many people know that our wetlands are in danger. Without any real facts, people quickly conclude that this is a catastrophe and that any other option must be a better option.

If we really want to make a difference to the environment, we have to start asking for real data. We can’t rely on common sense and gut feelings.

***Is Coir Sustainable?***

A recent study (ref 1) looked at this question in great detail. They tried to quantify parameters for many aspects including:

* Key materials in the supply chain
* Economy
* Biodiversity
* Water, air and soil pollution
* Water consumption
* Energy consumption
* Culture and working conditions

It would be nice if such studies resulted in a *sustainability number* that could then be compared to the sustainability number of other options, but it doesn’t work that way. Instead the study highlights areas of concern, what they call hotspots. The following are some hotspots for the coir manufacturing process (full details can be found in ref 1).

***Processing Coir Pith***

Creating coir pith requires more than just physically separating the fiber. Once the coir is freed from the fiber it goes through a maturation process to stabilize the product and this can take up to 6 months. During this process salt, tannins, and phenolic compounds are removed. It is buffered, washed and calcium nitrate is added to displace sodium and balance the pH.

This process requires input chemicals and it produces waste products.

***Water Consumption***

Processing coir requires a significant amount of water and in some areas like India, water is already in short supply. It takes 300 to 600 liters of water to wash one cubic meter of coir pith (80-160 gallons per 1.3 cubic yards). The result is polluted water that impacts the environment.

Comments such as “the horticultural use of coir helps solve a waste disposal problem”, does not hold water.

***Worker Health***

The whole process is very dusty and creates an unhealthy environment. Workers in coir pith factories often work six-day weeks with multiple shifts. We don’t normally think of this as a factor in sustainability, but it is.

A study on this concluded that “coir work induced nasobronchial allergy and pulmonary function abnormalities” (ref 5). In North America and Europe it would be illegal to work under such conditions.

***Nutrient Depletion***

As coconuts grow they remove nutrients from the soil. If the resulting coir is now shipped overseas it can’t be used as a local organic source to replenish the missing nutrients. The result is that more fertilizer needs to be brought into the plantations to grow coconuts which has an additional environmental impact.

Small coconut farmers are not sending their coir for processing and instead use it as a fertilizer source. But this will change as the demand for coir increases.

Coconut plants are renewable – new trees bear fruit in 6-10 years. But the soil being used for growing them is not renewable if the majority of organic matter is shipped overseas.

***Conclusion: Coir is Not Sustainable***

Many websites claim that coir is sustainable since it is a waste product. Packages of coir even have the word on their label, telling customers they are eco-friendly. It is simply not true.

Coir requires significant processing that uses input resources and produces waste products. It also posses health risks. Perhaps the most significant long term problem is the depletion of soil nutrients.

Admittedly, there are degrees of sustainability, but I think it is a stretch to call coir sustainable or environmentally friendly.

***Coir vs Peat***

Use of either coir or peat has an impact on the environment – so which one is worse?

There is not a lot of good data on this yet but I did find one study that looked at this problem. A [study by Quantis](http://www.epagma.eu/sites/default/files/documents/epagma_growing-media-lca_final-report_2012-01-17_quantis.pdf) looked at the environmental impact of various soil-less mixes to try and determine which had the least impact (ref 6).

The study looked at the complete life cycle of the material; production, delivery, processing, distribution, use and end of life. It considered impacts to climate change, resources, human health, and ecosystem quality. It concluded that “it is not possible to clearly identify any among the growing media as the least or the most impacting across all the indicators” (ref 6).

Peat moss affects climate change and resources the most. The impacts by peat include transportation, land use change, CO2 production, and aquatic eutrophication (loss of bogs).

Coir affects human health and ecosystem quality more than peat. The impacts by coir are due to transportation, electricity consumption, use of calcium nitrate for buffering, land occupation, and production of particulate matter.

 This type of study is based on estimations and limited accurate data, but they do provide a general understanding of the situation. Both peat and coir have significant impacts on the environment and according to the current data, neither one is considered significantly better than the other.

***Is Coir a Good Alternative to Peat?***

From my previous posts, [***Peat and Peat Moss The True Story***](https://www.gardenmyths.com/peat-peatmoss-true-story/) and [***Peat and peat Moss Alternatives***,](https://www.gardenmyths.com/peat-moss-alternatives/) it is clear that the use of peat in horticulture is not having a significant impact on the loss of peatlands. Year over year, the amount of global peat is increasing faster than it is being used. Some [86% of global peatlands are untouched by humans](https://www.gardenmyths.com/peat-peatmoss-true-story/) – there is no environmental catastrophe.

If society wants to reduce peat use, their efforts need to be focused on agriculture and forestry, not horticulture which uses less than 1% of the yearly peat harvest.

However, it does make sense to reduce the use of [peat as a soil conditioner](https://www.gardenmyths.com/peat-moss-alternatives/). There are better options that have less environmental impact. Finding an alternative to peat moss for the cultivation of plants in pots will have little environmental impact.

Coir may be a suitable alternative to peat for pot culture, but it also has environmental issues. Based on current data, it is not more environmentally friendly than peat. The environmental cry to replace peat with coir is unfounded. This is especially true for societies that live close to peat sources where transportation  of peat can be kept to a minimum.

References:

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