Coir in Australia

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Currently, the global annual production of coir fibre is about 350,000 tonnes of which India and Sri Lanka account for about 90%. Other coconut growing countries, such as the Philippines, Thailand and Vietnam are also now expanding their production and export of coir.

The world scene

The coir industry uses what has been historically left as a useless by-product of the coconut industry. Prior to the use of coir in horticulture, large waste stockpiles of coconuts were left on the sides of the roads and in growing fields, leaching salts and phenolic compounds into agricultural soils rendering them useless.

While the coir industry has been a very profitable solution to this problem, there remains an issue with some less respectable enterprises where working conditions and productivity are generally poor. Reputable companies dealing in coir practice ethical sourcing, giving workers fair pay and conditions.

There are several factors that affect the quality of coir. First and foremost is the proximity of the source material to coastal regions and therefore its potential for salt accumulation.

Most experienced coir suppliers are well aware of this and try to avoid coir from coastal regions. When and if they do, they use diligent washing processes to remove the excess salt. It is likely only to be an issue with coir produced and sold as an unwashed product.

This product usually comes into Australia via sole traders, at a price cheaper than the cost of production of reputable producers that follow due process. In short, you get what you pay for.

Coir processing

The first process that coir undergoes is the removal of any excess salts (sodium, potassium and chloride). Buffering is not necessary if the final EC of the coir is low enough but may be desirable to optimise plant growth in the initial stages.

The processing of coir has come under criticism for the quantity of water used in the washing process. In some cases, the washing process is not done locally but is transferred to the country doing the bulk of the processing. This minimises the environmental impact of salt being washed into the environment in the place of harvest.

An ageing process follows to reduce the carbon: nitrogen ratio and the levels of harmful phenolics in the material. The microbes that degrade lignin require a ratio of about 24:1 to function. Below this they cannot proliferate – their growth requires nitrogen. The less microbes there are, the less nitrogen drawdown (which adversely affects plant growth) and the slower the rate of decomposition of the product.

Coir longevity

The longevity of coir is in part manipulated by changing the proportions of pith and fibre/chip in the product. A substrate with more pith has a higher water holding capacity but will have a shorter lifespan than a substrate with more fibre and/or chip. This is due to the lower percentage of lignin in pith, making it more susceptible to decomposition via microbial interaction. All this must be weighed against the requirements of the crop in which it is being used.

Chemical & physical properties of coir

Coir has a high lignin content of 20-40% making it highly resistant to degradation. It also is far less likely than other potting mix components to become hydrophobic (non-wetting) after drying. Fibre, however, has a very low water holding capacity (WHC), so should be used sparingly and as short cut fibres to prevent pockets of poor moisture distribution.

The expansion ratio of coir on re-wetting is high and depends on the particular mix of pith, chip and fibre being used. Strawberry growbags, for example, which are about 1000 x 200 x 80mm (2 kg weight when compressed) will hydrate out to a volume of about 16 L. Raspberry bags which weigh about 1 kg, hydrate out to between 9 and 10 L.

The water retention curve of coir is quite like that of peat with a large proportion of water released at under 1kPa of suction, making the process of plant water uptake quite energy efficient.

Sometimes coir is mixed with perlite or peat but often it is used by itself with proportions of coir fibre and pith or chip varied to tailor the WHC and air-filled porosity (AFP) to each crop's specific requirements.

Due to the sensitivity of berry crops to both salinity and WHC/AFP, research into coir blends has also expanded into other parameters affecting crop longevity and productivity such as container volumes.

The pH of coir is between 6 and 7 so unlike sphagnum peat moss it does not require liming. The cation exchange capacity of coir is variable, somewhere between 30 and 100, not too dissimilar to coir, this relatively high CEC also helps stabilise the pH.

Quality

Quality coir should be 100% sterile.

Coir accreditation

There is no official accreditation scheme for coir products in Australia. In the Netherlands, a private company (www.rhp.nl/en/home), manages the quality mark 'RHP' for substrates, growing media and potting soils as well as 'RAG' for green roof substrates, soil supply and soil improving materials.

They conduct a range of research, training and education activities to ensure that the end product conforms to a range of general, chemical and physical properties and will fulfill the phytosanitary requirement of importing countries. Latter entrants into the coir market have adopted this certification to generate market space, but it has generally only been considered relevant to the hobby side of the market in Australia since reputable suppliers have their own in-house testing and quality assurance.

Biosecurity issues

Weed seeds can be an issue. Currently, all care is taken to minimise the risk (largely on sourcing raw materials from various vendors) and containers are fumigated and/or inspected prior to leaving countries of origin. In the past fungal pathogens have also been found in coir. On the other side of the coin, unsterilised coir has also been found to support various beneficial fungi such as *Aspergillus terreus* however the importation of such coir would not be permitted.

Mixed coir material

Currently imported coir must be:

- 100% coir
- clean, free from soil, contaminant plant material, animal material and be subjected to microbiological testing for *Salmonella* and *E. coli*
- packaging used with the consignment must be clean and new

Note that these conditions do not preclude the occurrence of other issues affecting coir quality such as sodium chloride accumulation.

Compressed coir block

Summary

Coir is a remarkably versatile substrate with wide application across a number of horticultural crops.

It was probably first recognised for its excellent water holding characteristics, and logistically, is highly efficient to transport in the dry, compressed state.

In recent years, growers have found the longevity of coir to be superior to many other container mix components such as rockwool, pine bark and sawdust. This is particularly useful for perennial crops such as blueberry and raspberry.

As interest in and adoption of coir substrates continues to grow in the berry industry so does research and development to support the use of coir in these crops.

Much of the R&D done by the more reputable companies is in-house and available only to growers using their products.